APPENDIX D

PUBLIC MEETING TRANSCRIPTS

Public Meeting Transcripts

This appendix contains the official transcripts from the public meetings held on May 12, May 14, and June 20, 2001 for the purpose of commenting on the Proposed Plan for OU-2. The transcripts were reviewed and several corrections were noted to the official transcripts. The corrections pertaining to each public meeting are as follows:

Court Reporter #1, Vickie Blair: Public Meeting held May 12, 2001

NUMBER	PAGE	LOCATION	CORRECTION
1	5	Line 1,5,and 6	"NAFAC" should be "NAVFAC"
2	7	Line 18	"vado zone" should be "vadose zone"
3	9	Line 24	"remediate" should be "remedial"
4	10	Line 8	"vado zone" should be "vadose zone"
5	25	Line 13	"gasses" should be "gases"

Court Reporter #2, Leslie MacNeil: Public Meeting held May 12, 2001

NUMBER	PAGE	LOCATION	CORRECTION
1	5	Line 11,14,and 15	"NAVFEC" should be "NAVFAC"
2	10	Line 9	"arroyo" should be "Arroyo"
3	18	Line 11	"you" should be "up"
4	27	Line 3	"been" should be "then"
5	36	Line 10	"THE FLOOR" should be "MS. TUTT"

Court Reporter #1, Vickie Blair: Public Meeting held May 14, 2001

NUMBER	PAGE	LOCATION	CORRECTION
1	5	Line 2,5,and 7	"NAFAC" should be "NAVFAC"
2	8	Line 13	"NASA/JPL" should be "NASA-JPL"
3	9	Line 7	"sound" should be "found"
4	9	Line 13	"remedial investigation feasibility study" should be "remedial investigation/feasibility study"
5	10	Line 17	"faculties" should be "facilities"
6	13	Line 5	"Faculties" should be "Facilities"
7	19	Line 1	"our on" should be "on our"

Court Reporter #2, Leslie MacNeil: Public Meeting held May 14, 2001

NUMBER	PAGE	LOCATION	CORRECTION
1	5	Line 9,12,and 13	"NAVFEC" should be "NAVFAC"
2	7	Line 15	Replace "standard" with "state"
3	8	Line 23	"won't" should be "want to"
4	9	Line 18	"arroyo" should be "Arroyo"
5	13	Line 6	"random" should be "ran the"

Court Reporter, Vickie Blair: Public Meeting held June 20, 2001

NUMBER	PAGE	LOCATION	CORRECTION
1	5	Line 14, 17, and 19	"NAFAC" should be "NAVFAC"
2	8	Line 9	"congress" should be capitalized
3	10	Line 16	"depositories" should be "repositories"
4	11	Line 25	"1,1, -cichloroethene" should be "1,1,-dichloroethene"
5	19	Line 16	"private road" should be capitalized
6	19	Line 17	"south gate" should be capitalized
7	21	Line 7	"taking" should be "talking"
8	21	Line 13	"immediately" should be "immediately"
9	26	Line 3	"depositories" should be "repositories"
10	28	Line 21	"Cynthis", I believe her name was Cynthia.
11	30	Line 3	"RPN" should be "RPM"
12	30	Line 3	"RPN" should be "RPM"
13	30	Line 20	Insert to read: "vapor samples"
14	32	Line 24	"rain basin" may be "Raymond Basin"
15	33	Line 4	"rain basin" may be "Raymond Basin"
16	34	Line 24-25	"responses in the summary" should be "responsiveness summary"
17	37	Line 10	"air circulating" should be "soil vapor
18	37	Line 22	"Britta" should be "Brita"
19	38	Line 11	"Force Wheeler" should be "Foster
20	38	Line 21	"Geofund" should be "Geofon"
21	39	Line 8	"Geofund" should be "Geofon"
22	39	Line 23	"Geofund" should be "Geofon"

NUMBER	PAGE	LOCATION	CORRECTION
23	40	Line 2,3, 10, 16	“Patel” should be “Battelle”
24	40	Line 5	[unintelligible] should be “Proposed”
25	40	Line 13, 19	“Geofund” should be “Geofon”
26	57	Line 11	“response [unintelligible]” should read “responsiveness summary”
27	57	Line 22-23	“response to summary” should be “responsiveness summary”
28	58	Line 2	“Mr. Compton” should be “Ms. Compton”
29	58	Line 8	“Response in the summary” should be “responsiveness summary”
30	64	Line 8	“hearing” should be “meeting”
31	64	Line 15	“response summary” should be “responsiveness summary”
32	65	Line 1	“information depositories” should be “information respositories”
33	67	Line 6, 8	“information depositories” should be “information respositorie

PUBLIC MEETING AND PUBLIC COMMENT PERIOD

JET PROPULSION LABORATORY

PASADENA, CALIFORNIA

SATURDAY, MAY 12, 2001

1:00 P.M. to 4:00 P.M.

Reported by:
Vickie Blair
C.S.R. No. 8940, RPR-CRR

PASADENA, CALIFORNIA; SATURDAY, MAY 12, 2001
1:00 P.M.
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MR. SAUNDERS: Good afternoon. Welcome to the Jet Propulsion Laboratory. Thank you for taking the time to attend this meeting on a Saturday afternoon.

My name is Lee Saunders. I'm an environmental public affairs officer for the U.S. Navy and your facilitator for today's meeting about the proposed plan to select a remedy to clean up soils at the National Aeronautics and Space Administration, Jet Propulsion Laboratory, located here in Pasadena.

Prior to this meeting, you had the opportunity to speak to NASA, federal, and other local leading regulatory agency representatives on a one-to-one basis about the proposed cleanup actions. During this portion of the meeting, you, the community, can provide questions and comments to these representatives and their agencies on the proposed plan. These comments and questions will be included in a meeting transcript and become part of the final decision made for soil cleanup at JPL.

Representing the agencies responsible for the cleanup and talking to you about the proposed plan and

its remedial alternatives are agency representatives who will each introduce themselves starting from my left here.

MR. ROBLES: Peter Robles from NASA.

MR. ZUROMSKI: Richard Zuromski from the Naval Facilities Engineering Command.

MR. GEBERT: Richard Gebert from the State of California Department of Toxic Substances Control.

MR. RIPPERDA: I'm Mark Ripperda from the U.S. EPA.

MR. YOUNG: I'm David Young from the Los Angeles Regional Quality Control Board.

MR. SAUNDERS: All these representatives are what we call remedial project managers that are responsible in one way or form in the cleanup of this particular site.

Ground rules. I want to talk about ground rules for today's meeting, which are as follows: This afternoon's format will consist of presentations by representatives about the proposed plan and remedial alternatives, followed by a formal comment session where you, the community, can provide us with your comments and questions.

I'm going to ask you to please hold your questions until the presentations have been completed. Once we've heard from all the presenters, we will open the floor for questions and comments. You may want to use the sheets of paper that were distributed, the comment sheets,

to write down your questions during the presentations in case you have some questions that you develop and you just feel you can't wait until the time comes. But that will help you keep track of what those questions are.

To ensure that everyone that wishes to make a comment or ask a question has a fair and equal opportunity to do so, we ask that you limit your comments or questions to two minutes. At the end of this time, please take your seat. If you have not finished your remarks, you may continue for another three-minute period after we've heard from all the other speakers.

We have a court reporter -- actually, we have two court reporters here today, so we ask you to please state your first and last name and spell your last name before you begin your comments or questions.

If you do not wish to provide verbal comments or questions, you may also submit your comments and questions in writing. There are comment sheets that I just mentioned a moment ago available on the tables in the back for those of you in the audience who would prefer not to give your input or comments verbally at this meeting.

For those of you wondering why the U.S. Navy is involved with the environmental cleanup of a NASA facility, the explanation is fairly simple. In 1999, NASA and the Naval Facilities Engineering Command, who I work

for, who are commonly known by the acronym NAFAC, reached a memorandum of agreement establishing roles and responsibilities that state that NASA may procure environmental engineering and consultancy services from NAFAC and its subordinate commands.

In late 1999, NAFAC remained heavily involved in providing environmental services to NASA JPL. Peter Robles, our regional project manager from NASA, is our first presenter.

Peter.

MR. ROBLES: Good afternoon.

The first thing we want to talk about is our presentation. What we are going to present this afternoon is a site description, regulatory framework, site assessment and investigative activities, and our remedial activity and proposed remediation alternatives.

In other words, we're going to go and follow along what the booths in the back are in sequence so that you can get a feel for the total history of this site.

There it is. Site description. The site has been active since the late '30s to early '40s. It was part of a project out of Cal Tech. The Army Ordnance took over the site in the '40s and became the owner of the site, and work was done here for the Army Ordnance service, particularly during the World War II era.

At that time during the '40s and '50s, the proper and acceptable way of disposing of chemicals was done through what we call seepage pits. Seepage pits are no more than bricks without the binding between them so that things can seep out into the ground through them. At that time, it was accepted. Most of that was working on propulsion systems to support jet aircraft -- we call JATO, jet assist to take-off rockets. Also reverse engineering of V-II rockets from World War II and further on.

During the late '50s, early '60s, the Army Ordnance was working in negotiating with NASA, and NASA took over the site in 1959, 1960, at which time what we did was we replaced the seepage pits with a sewer system so, therefore, we could stop that type of activity.

Up until that time, there was not a problem with the ground or soils in the area. But in '92 was when the concern came about, and we were placed on the national priorities list by EPA. And at that time that made us a SuperFund site, which is the process that we have been talking about these last couple of hours with you. That process started in October of '92. We signed a federal facility agreement, and the process started for us to investigate the site.

Current activities right now is that all of our operations meet federal and state and local

regulations. And, by the way, I was told by our people to say this, that almost all, very small percentile, is ever sent through disposal. We recycle and destroy as much as we can here. And the fact is, this facility is the best in NASA for recycling materials and chemicals that are used here. And we do a lot of research here. But we meet all federal, state, and local requirements, so current operations is not a concern. We're talking about past acceptable practices that we are trying to remediate.

Here is a site description of what we're talking about, and here's the gist of the problem. Because of the seepage pits and the stuff that was put in there, they slowly -- and it takes years to migrate through the soils and to reach the water table.

Our biggest concern is between 50 feet below the surface all the way down to 200 feet. And the main purpose of our discussion today is to talk about remediating what we call Operable Unit 2 vado zone. "Vado zone" is an engineering term for just the soils between the surface to the water table. We want to remove this source so that it stops migrating and impacting the environment. And that's what our focus is today, about minimizing that, removing that, and we have certain technologies that we have tried.

NASA will address the groundwater issue in

the future. We plan another meeting like this next year to talk about remediating groundwater Operable Unit 1 and 3; but for today, we want to focus on the soils.

And now I would like to turn this over to our regulatory framework speaker, which is --

MR. RIPPERDA: Thanks, Peter.

I'm Mark Ripperda from EPA, and I'm kind of speaking for all the regulators, for Richard and David who are here from the State of California.

But first I'd just like to ask that all of you from the public go home and tell your friends, tell 10 friends each, how much fun this is, how much you learned, and tell them that they have to come back on Monday night.

So what does it mean to be a SuperFund site, and for that matter what is SuperFund? Congress, about 20 years ago, passed a law that put a tax on the chemical industry, and that money from the chemical industry all went into a trust fund that's called the SuperFund that EPA is authorized to use to spend to clean up abandoned hazardous waste sites. That same law also gave EPA the authority to go after existing facilities such as NASA JPL that have had releases that need to be cleaned up.

But before you become a SuperFund site, you have to go through a rank process. EPA evaluates how bad the site is, how bad the potential risk might be. And if

you score high enough, you're put on the national priorities list, which means you're a SuperFund site. And right now there's about 2000 or so SuperFund sites.

So after the discovery of the release, and for NASA JPL, that meant that the City of Pasadena found chemicals in their drinking water wells -- I'm not sure which way is east and west here -- over this way. Right across the Arroyo, City of Pasadena had some drinking water wells, and they found levels of chemicals in there that were high enough that they needed to put a treatment system on them. At that time, all that information is turned in to EPA; we rank it and say, "Okay, this needs to be a SuperFund site."

But the first thing that happened is that as soon as the City of Pasadena found those chemicals, they put treatment systems in. NASA had to reimburse the City for that, and then NASA needs to start looking at their site and determine where those chemicals came from, how much there might be, and how best to clean it up so the groundwater in the future is not getting either more contaminated; and, in fact, we can start to clean up the groundwater itself.

So to do that we do what is called a remediate investigation and feasibility study. That means we look through all the records, what kind of chemicals are

used on-site. NASA drilled bore holes all over the site. They drilled monitoring wells to take samples of groundwater both on-site and off-site. They sampled drinking water wells from all over the area to try to determine the extent of the problem and to design a way to best clean it up.

And that brings us to about where we are now for the vado zone soils. So NASA JPL have completed the investigation of the soil zone, and they're making a proposed plan to you, to the public, saying that, you know, "We think we understand the problem. We think we know the best way to clean it up, and what do you think?" You know, both "What do you think of what we've done, and what do you think of what we," NASA, not me, EPA, "is saying on how to clean it up?"

So if you do have any, not just questions, but if you have any comments on what they're proposing, please make those either today or after the meeting in writing. Let NASA know what you think.

At that point, NASA needs to respond to all those comments. They'll do a written response that gets sent out to the public; it gets sent to the regulators. State of California people, and we at EPA review NASA's response and say either, "Yeah, you did a good job responding or not."

And if everybody agrees that this is the best way to go, then they'll do an actual legal document called a "Record of Decision" where they say, "This is what we're selecting to do."

And then from there, they actually design the system. Right now they have a rough idea -- you know, if you've been talking to us back there, you know they're planning to put in about five bore holes. That's not set in stone; that's an estimation of what we think would be best. But actual -- after public comments are received and the decision of record is signed, then the contractors will do a more detailed study. And it will probably be five bore holes plus or minus a little bit, but they'll do the actual details of the design.

And after the soils are cleaned up, there will still be long-term monitoring to make sure that the remedy actually worked. And all of this is separate from the groundwater system, which, as Peter said, will be addressed in kind of six months to a year. There will be another meeting with another proposed plan on how NASA plans to clean up the groundwater.

And kind of like I already said, the whole point of this is just to get the public involved. So please tell your friends to come, tell people you live near what's going on, and, you know, give us any comments or

concerns you might have.

MR. ROBLES: Tell them about the cookies.

MR. RIPPERDA: And eat that table full of cookies. Richard.

MR. ZUROMSKI: Thank you, Mark.

Hi. I think I've talked to some of you. My name is Richard Zuromski. I'm with the Naval Facilities Engineering Command, and I'm here today to talk to you about the site assessment and investigation activities that have been done here at JPL, and also what we're proposing as a remedy for JPL OU-2.

First I'll start out with the remedial investigation. From 1994 through 1998, JPL conducted the remedial investigation in over nine sampling events, different sampling events. They looked at 45 soil vapor wells, 35 soil borings, and three test pits. Now, they've also, at the end of that remedial investigation, established 37 permanent monitoring points for soil vapor that we monitor on a quarterly basis. So we are continuing to monitor the extent of VOCs in the soil to date on a quarterly basis.

The samples that we took during the remedial investigation identified the extent to which the chemicals were found in the soils. The results showed that there were elevated levels of four different chemicals in the

soil vapor. These four chemicals were carbon tetrachloride, trichloroethene, Freon 113, and 1,1-dichloroethene. These chemicals are chemicals that are used as cleaning solvents. When we used to test the old rocket motors here back, as Peter was saying, back in the '30s, '40s, and '50s they used to clean out the rocket motors with these solvents, and that's how they came into the ground here at OU-2.

Secondly, I want to talk to you today about the OU-2 risk assessment. The human health risk assessment found that there were no risks above regulatory thresholds from exposure to humans to soils or soil vapor. Now, as Peter mentioned earlier, the main reason is that these chemicals are more than 50 feet below the ground surface where we are today, so it's really very, very unlikely that any of you will come in contact with those chemicals.

However, also, as Peter and Mark mentioned, there is a risk that these chemicals will continue to migrate. They've already migrated 50 to 200 feet down, and they will continue to migrate to the groundwater, and that is the purpose of the remedy that we're proposing here.

Now, we are currently studying how we're going to remove the VOCs from the groundwater. And, as mentioned earlier, that's going to be the subject of another public meeting almost exactly like this in the near

future.

However, in the meantime, again, to reiterate what Peter said, there isn't a risk from the chemicals in the groundwater because your water purveyors or the individuals who have to deliver the water to you have to meet very strict regulatory requirements. But the focus of today's meeting is looking at how we can remove what we're calling source removal. It is how can we remove the chemicals that are in the soil that may potentially continue to migrate into the groundwater. And that's what we're looking at today.

Now, this graphic shows the extent to which VOCs at any level, whether that was a very, very small level or a high level were found at JPL during the remedial investigation. Now, to date -- I don't know how many of you had a chance to look back at our table back here, but the size of this area is smaller to date; and so if you are interested, please take a look. But this was during the 1994 through the 1998 remedial investigation. The highest levels -- like I said, this is the extent of all levels that we found during our remedial investigation; however, the highest levels that we found were here in the north central part of the site. And that's where most of the lab activities were taking place at the time.

Now, based on the results of what we did in

the soil investigation and the remedial investigation and also our continued quarterly monitoring program for soil vapor, we have found that, as I said, the VOC vapor plume has not migrated in soil vapor off the site. This is about the limit. It's about 45 acres here on the site in soil vapor, so it hasn't gotten any bigger than this.

And, again, I encourage you to take a look after the formal presentation at some of the other documents we have in the back that would show you some of the more current conditions.

Now, like I said, based on the analysis of the remedial -- during the remedial investigation, the remedial objective for OU-2 is to prevent VOCs from migrating to the groundwater. That's our objective here.

To meet this objective, we looked at several alternatives, and these were investigated in what Mark called earlier the feasibility study. Of these alternatives, two were selected for a very detailed evaluation, as mentioned in the proposed plan that was sent out. Others were looked at and, for example, just weren't found to be feasible. For example, it would be very unfeasible to try to dig out soils underneath all the buildings here at JPL where the soils are more than 50 feet below the buildings here on-site. So we wanted to look at two alternatives in detail that we wanted to make sure were

viable alternatives for cleaning up the site.

The first is no further action. This is a default that is used to compare all other technologies to. It would involve maintaining our quarterly soil vapor monitoring program and any possible natural degradation of the chemicals in the soil and the soil vapors.

The second is soil vapor extraction with granular activated carbon treatment. Now, this technology would involve placing up to five soil vapor extraction wells and five extraction systems or treatment systems, and also continuing the ongoing quarterly soil vapor monitoring program here at JPL.

To help us evaluate the technologies and the alternatives, we conducted a pilot study of the soil vapor extraction technology at JPL starting in 1998. Again, some of the results from our pilot study are available at the tables in the back, but what it showed in over 14 months of operation, we removed over 200 pounds of these chemicals from the soils. Now, it was so effective during our pilot study that we do continue to operate the pilot study to date, and it does continue to remove the chemicals from the soil vapor to date.

Now, this is a conceptual drawing of how soil vapor extraction works. Now, let me point out some of the details of this diagram. It's fairly simplified, but

it does give you a good picture of how soil vapor extraction works.

First, here, this is the past seepage pits that were used back, as Peter said, back in the '30s and '40s that released VOCs into the soil and soil vapor. These VOCs are basically -- it's like a vacuum. The soil vapor extraction is like a vacuum that sucks these soil vapors, the chemicals, into this extraction well, right here, and extracts the vapors in a gaseous phase to the surface through this little pump. The pump then sends the chemicals into the vapor treatment system. Now, the vapor treatment system consists of granular activated carbon. What it does is -- actually, it's like charcoal. What it does is when the vapors with the chemicals go through the carbon, they bind to the carbon and they stay permanently in the carbon and clean air is released from the system. So, basically, all of the chemicals that are sucked from the ground through the system remain in the vapor treatment system and are permanently removed from the soil vapor.

So based on our analysis, based on the remediation investigation, based on our soil vapor extraction pilot study, alternative one was not chosen because it just doesn't prevent the migration of VOCs to the groundwater. Therefore, the proposed alternative for OU-2 is soil vapor extraction. Soil vapor extraction would

be used to reduce the source of the chemicals in the soil vapor so that they do not migrate to groundwater. It would permanently remove them from the soil vapor to the system.

Soil vapor extraction works very well for several reasons.

First, number one, it permanently removes the VOCs from the soil vapor.

Number two, it works very well in the types of geology and soil that we have here at JPL, and that was shown during our pilot study.

Third, it protects the groundwater from further migration of these chemicals through the soils.

Fourth, the treatment period is relatively short, probably from one to five years, operating these types of systems.

And, finally, because of these advantages, and because soil vapor extraction has been so successful, not only here in our pilot study, but at sites all over the country, it's given the name "a presumptive remedy" by the United States EPA. What a presumptive remedy is, it's the most effective technology for conditions similar to JPL as was seen at sites tested throughout the country. And that's another main reason why we're proposing soil vapor extraction for OU-2.

Based on the pilot study data, based on the

results of the remedial investigation and ongoing quarterly monitoring, we are proposing soil vapor extraction as the proposed alternative for JPL OU-2.

Lee.

MR. SAUNDERS: Thank you, Richard.

We're now going to go into the comment phase, comment and question phase, of this meeting. As a quick reminder: To ensure that all participants' comments or questions receive equal treatment, please limit your comments and questions to two minutes. We also ask you to please state your first and last name and spell your last name for the court reporters.

Thank you.

Do we have any speakers that would like to comment or ask any questions? Please step up to the mike. Don't be shy. Any questions or comments that you want to submit to the court reporters in writing?

Yes, ma'am. Would you step up to the mike, please.

MS. TUTT: My name is Elaine Susan Tutt, and my last name is T- as in Thomas -u-t-t as in Tom. And I'm a resident of Altadena, and I also work here at JPL.

Yeah. What I would like to ask is for the alternatives. There's alternative one and alternative two, and it seems like alternative one is not really an

alternative, but it's just continuing not to do something. If I'm wrong about that, I'd like to be corrected.

And so alternative two is to pursue the soil vapor extraction. And it's interesting. I appreciate the description that was given today. I wonder if some folks from either the Navy or maybe someone -- the fellow from the EPA could tell us more about some other alternatives that were considered for this.

Also, my other comment is that I just received the notice, an invitation to this meeting, today, May 12th. And the meeting -- I just received it in the mail today, May 12th, from the post office in my mailbox here in Altadena, and today the meeting is also May 12th. So I'd like to comment that this is not soon enough before the meeting to be able to get people over here and tell people about what an interesting meeting this is. I think that if we would have known about it a little more in advance, it would have helped --

MR. SAUNDERS: Thirty seconds.

MS. TUTT: Thank you.

-- it would have helped to get more interested community members out to the meeting. So I just wanted to just pass that along. I would think that at least 10 days would be the minimum that you would let us know in advance of the meeting.

Thank you.

MR. RIPPERDA: I'll say something from the EPA's perspective on your question on alternatives, and I also agree with you about the short notice. That's inexcusable on our part, on NASA's part. You know, I'm not sure why it happened that way. It wasn't supposed to. These things were supposed to be mailed out about 10 days ago. So we screwed up, and I have to take responsibility for that, too, because I'm supposed to be overseeing what NASA's doing to make sure they do it right.

But back to the alternatives.

It does look like, you know, NASA is not giving anybody very much choice. They're giving you alternative one and alternative two, and alternative one is essentially do nothing. But in a -- we talked about this, actually, before the meeting, saying, "Wow, you know, we're not giving people much choice here." But it's what Richard said about a presumptive remedy.

In a case like this, soil vapor extraction has been used at thousands of sites around the country. It's been the one and only technology that's proven to work consistently at sites like this.

You know, there are other things you can do. You can dig up the whole site, but EPA doesn't require a facility to investigate, you know, obviously ridiculous

choices such as digging up the entire site.

But there's other things you can do like injecting steam to make it be cleaned up faster. That would be called an innovative technology. But we don't really require that a facility look at things like that that would cost so much more when an off-the-shelf technology works so well and relatively quickly.

So even though it looks like there's really not much choice here, it's because NASA is following the process that's kind of set in law by Congress that they're supposed to look at alternatives, but we've been doing this long enough that the alternatives that it boils down to in some cases are very few, or, in this case, only one real alternative.

Congress makes us look at "no further action" just as a baseline to make sure we're not out there spending money willy-nilly. And other than that, the way the law was written by Congress, you know, we're supposed to look at viable alternatives. And, in this case, we have enough experience to know that soil vapor extraction is actually the only viable alternative. But we're still supposed to do it in this way where we go to the public with our various alternatives that NASA is proposing. We haven't changed the process even though we've learned enough to know that there actually is only one real

alternative here.

So I don't know if NASA wants to say anything.

MR. ROBLES: Just because it's SVE now doesn't mean that if, in the future, new technology comes in that we find better that we won't revisit this. This is not like cast in stone right now. So I want to assure the public that as technologies develop, we are required through the process to periodically review what we're doing, and if we see something better, and if an issue comes up that we want to augment the SVE with another technology that has appeared to be better, that's what we do.

So as the technology improves, one of the things -- I've been in this business 30 years. One of the things that amazes me is that the regulations are always set forth before the technology catches up. But as technology improves, we in the environmental community can say, "Okay, look, this new technology might be better than be SVE, so let's replace it or let's augment."

So don't think that this is it. We're only going to do SVE, and that's it; we've lost the opportunity. We are required through the process, and Mark is always on my case about this, is to make sure that the technology matches what we need to do. And so we're going to revisit this. It's not cast in stone.

We have meetings quarterly, and we will discuss this, and we will have information meetings in the future because we still need your inputs. So as we go on, hopefully we'll find some technology with the silver bullet that will clean everything up, we hope, some day. But until now we have to use what we've got.

MR. ZUROMSKI: I just want to make two quick comments just to clarify what Peter said, as well.

It's true that every five years we do what is called a five-year review once we sign the legal document that Mark talked about called the ROD, the record of decision. So every five years, we do review what we've done and, again, see if we're doing the right thing.

And, secondly, as I think was mentioned today, this is the proposed alternative, as well. The opportunity here is that we are presenting, though limited, but what we think is the best alternative. We do encourage your comments as to what you think, if this is the best alternative. And that's why this part of the process involves public comment.

So thank you.

MR. SAUNDERS: Any other comments?

MR. ROBLES: Just a couple of comments I wanted to make was we did mail these out on Tuesday, May 8th. Obviously, it wasn't enough time, so we'll definitely make

sure that we mail these farther in advance to get them out to you in plenty of time to plan to attend the meeting.

And one other comment, as Richard was basically saying, is the purpose of this meeting is that you can come here and provide some alternatives that you feel might be useful to add into the record that we could consider in the future.

Are there any other comments or questions from the public?

MS. BLAIR: I have one, yes.

My name is Susan Blair, B-l-a-i-r. I'm also an Altadena resident. Mine's a curiosity question. Once the gasses come up through the pipe into the chamber where the carbon is and it absorbs the chemical, what happens to those carbons?

MR. ZUROMSKI: What happens is once the carbon becomes full of all the different chemicals that we are pulling from the soil vapors, we have to, as Peter stated earlier, in accordance with all the state and local and federal regulatory requirements, take that carbon canister, remove it, and then it's either recycled or incinerated or somehow disposed of in a very legal manner off-site. And then we then replace the carbon with brand-new carbon and it continues the process again.

MS. BLAIR: Thank you.

MR. SAUNDERS: Do we have any other questions from the public?

Go ahead, ma'am.

MS. COMPTON: Cynthia Compton, C-o-m-p-t-o-n. I'm an employee of JPL and interested community member. I have a few questions, so I'll just plow through them in my two minutes.

You said that in the '50s to the early '60s, a sewer system replaced the seepage pits. Does that mean the chemicals are now going into the sewer system, and where do they go from there?

Other questions I have are: Is there a record of what other alternatives were considered other than these one and two, and where can we read or find out about that?

And it says the pilot system has removed 200 pounds of VOCs. Out of how many is predicted or known to be at the site?

It says that -- I think what I'm hearing is that the VOCs are in the vapor or the pockets of the soil, so what about the soil itself, involving the VOCs in the soil particles, and once you remove it from the vapor, does it now migrate from the soil particles back into the vapors afterwards?

And I also agree with the short notice to

the public, and that's why there are -- in my opinion, are not adequate representation from the community here. I got the E-mail notice on Wednesday, and didn't really see it until Friday, about six P.M. on Friday. And I would like to know: Is there some kind of record of when notices are sent out to the public and where they're at?

And the other thing is, I think I was talking to Richard about who these notices are sent to in a half-a-mile radius from the site. What about -- I understand sending it another half a mile to get more public is maybe too many -- you know, too costly, but what about sending the notice to the customers of the water companies that are involved?

MR. SAUNDERS: Time. Thank you.

Your questions are involved, and we'll address them one at a time.

MR. ROBLES: Good questions.

On the first one is we do not send chemicals down the sewer system. What happens is we try to recycle them. They're usually used up in the processes. If we can't recycle them, we try to destroy them in some form or fashion. The regulations try to minimize sending stuff down the sanitary sewer. Very particular about that.

I don't know if you've seen around the lab these circles with the ducks on them because they're

saying, "This is a storm water drain. This is sanitary sewer." We don't want chemicals going down there. That's part of our regulation. We have a whole office on-site to manage that. So that's not going down there. That's one of the reasons.

The second -- well, I'll answer your last item on the notices. There are repositories in the local area, the libraries, that you can get these documents, and there is on the record when we sent the notice. We do apologize. We had a little snafu. We had sent 4,732 mailers. Now, I have received some phone calls that people did receive them by Monday and Tuesday of this week, but there was a slight mix-up where you might have been the ones that didn't get it until later. We did send the E-mail out -- I don't know what happened. Well, we want to send it earlier, so that's a good comment. We're going to have to notice -- I think we're going to really have to send them more than 10 days earlier to make sure that the mail -- because there were some problems with some of the post offices in sending this stuff out, so we want to make sure it does.

We also put it in the paper. We put it in the four local papers and "L.A. Times." But I also notice that some people didn't see that, so we have to agument in the future -- so we have to be creative about which way --

do you guys listen to radio? Might that be a better way? I'm just asking because we're trying to get more items out, and that's why we have two meetings. So if you could tell the public, you know, I apologize, come out Monday. I would love to see a hundred people here or more. But we have sent 4,732 of these mailers plus the 6,000 JPLers who were contacted.

MR. ZUROMSKI: I think I'm going to address the other two of them. I think Peter covered a lot of yours.

The first, if you do want to see the other types of technologies that were evaluated, that is in the feasibility study and that is available at all of the document repositories. And that shows you the detailed analysis, like I talked to you about earlier, that we go through to evaluate technologies. It will show when certain things were dropped out and when certain things were retained. And it's very detailed. It's about three, four inches thick, but it's very easy to look at. So feel free; it's at all the document repositories.

The second question I think that I'm going to answer is the amount of chemicals that are in the soil vapor and how they move around.

There are different ways to technically estimate how much is in the soil vapor. I can't get into every little detail of how that is done. Again, that is in

the feasibility study, as well. But there is an estimate of somewhere between three to five thousand pounds, 5,000 being the maximum that we believe could be in the soil vapors, and that also includes what would be in the soils.

When we say "soil vapors," since they are volatile organic compounds, they tend to be in a vapor state, and so that is why we are removing soil vapors, versus soils themselves.

MR. RIPPERDA: I'll add a little bit to that. That's actually a great question about soil vapor versus soil, and what Richard said is right, but I'm just going to add a little bit.

So we estimate, or NASA estimates, that there's up to about 5,000 pounds total of these things, and that's total in the soils, absorbed in the soils and in the soil vapor. When it's located like it is, 50 to 200 feet below the surface, you actually have to drill a well, a bore hole, to get down to it. And the act of drilling that bore and taking your sample, you can't -- it drives the VOCs out of that piece of soil. So you can't just take a sample of the soil and analyze how much in the soil. It's just not very effective.

So what we do instead is we measure what's in the soil vapor, and that's very easy. You drill your same bore hole, and that sucks some air in, and that

volatilizes it off the soil. So we're being somewhat legalistic when we're always saying the VOCs in the soil vapor because that's where we actually measured it, and that represents how much is actually in the soil. And there are various equations that you can use based on soil chemistry with partitioning co-efficients and so forth to calculate from what you have in the soil vapor back to what you have in the soil.

So just because we always say "soil vapor," that doesn't mean we're only looking at the vapor. What we really care about is what is in the soil and about any rainwater that might migrate through that soil, deabsorb it, and carry it down to groundwater.

MR. SAUNDERS: Any other feedback from any other representatives?

MR. ROBLES: Did we answer all your questions, ma'am?

MS. TUTT: What about when you remove the VOCs from the vapors, as more chemicals evaporate out of the soil into the --

MR. ROBLES: Right. That's why you constantly do that. The question is -- one question that she had asked, once you remove the particles through the vapor, are there any particles left on the soil?

This is a continuous process because you

want it to volatilize that material because it's a volatile organic. So you want to draw it out. So you constantly are pulling pressure and putting a vacuum on it to suck it up. Eventually there should be no particles left there.

I'd say no because any system cannot be 100 percent clean. You can't get the last molecule out. What you're trying to do is get as low as possible until the technology doesn't work anymore, and then you wait for another technology. You say, "Hey, we're kind of finished, and there is no more threat to the groundwater." And that's what you do on that. It's not an exact science. We try our best, and that's what we do.

And that, like I said -- the document, as Richard said, is thick. It has everything in there that you want to know, and if it's not in there, we'll have informative meetings and we can give you the boring lecture. Because this is long and to read these documents right now at -- once we finish this process, sometime in the future, we're going to have so many documents that you will not believe. I mean, we generate so much information. This process requires of the government to do this to make sure that we make the right decision, and we have to publish these documents so you the public can read them and say, "How did you guys make that choice?" That's what we call the administrative record, and that's why we have that

in the repositories for you.

MR. SAUNDERS: I don't know if it was mentioned, the proposed plan information repositories are located on, if you want that information, on page six of this, the different information respositories. The item of record, I believe, is kept here at JPL.

MR. ROBLES: There's three.

MR. SAUNDERS: Okay. And, again, what you're telling us tonight is very useful this evening because we need this feedback. I believe this is the first time that you've held a public meeting here, so this is a learning process for NASA, for all of us. And we appreciate this feedback that you're giving to us. It will help us make the meetings better in the future, to communicate information to the public better.

Yes, ma'am.

MS. TUTT: The only question that wasn't answered is: Have you considered sending these public notices to the customers and the water companies that are impacted?

MR. ROBLES: Thank you. We have a representative here. I'm not going to put him on the spot.

We meet with the Raymond Basin Management Board. We have dialogue. We are meeting with the City of Pasadena on Monday. The water purveyors know about these meetings, and we have told them in their board meetings and

the word has gotten out that way. We have gone to local community meetings like, I think, Northeast Trees and a few others. We've told them about this.

We are looking to expand our mailing list, so if you can recommend some groups or people that you want to put on the mailing list, please let us know because we have no fear of sending as many as it takes so that the public -- normally, believe it or not, I've been in this business 30 years, and I've only been at one public meeting where it was standing room only and that was because the government needed to expand a bombing range. You know how controversial that was. But most of the time people get their information through the newsletter or they call up or they go to the repositories. But if you have any suggestions of people that you want on the mailing list or groups, please let us know. But this information has gotten out to the purveyors of water.

MR. SAUNDERS: I believe what you're referring to is like when --

MR. ROBLES: Oh, the customers? You mean the water customers?

MS. TUTT: You and me that are drinking water and paying the purveyor to send water to our houses.

MR. ROBLES: So you're asking should we send this to all the people who get the water?

MS. TUTT: All the customers who live within a half-mile radius.

MR. ROBLES: That's a good point.

MR. SAUNDERS: I think the point you may also be making, and I may be wrong about this, but when utilities, they have public hearings and such, they usually include a public notice in their mail-out in the billing. Of course, that is their mailing; it's not ours. So we would have to approach a utility to do that. Whether they would do it for free or charge us, I don't know, but that's something we would have to discuss with the utility.

UNIDENTIFIED SPEAKER: That's a community right to know.

MR. ROBLES: Right. That's a community right to know.

That's a very good suggestion that when we're going to talk about groundwater, a good thing to do might be to go and talk to the purveyors and see if we should send those notice -- that's a good point. Thank you.

MRS. BLAIR: The Lincoln Avenue Water Company, every member of the Lincoln Avenue Water Company is a shareholder, so they have the right to know that.

MR. ROBLES: That's right. That's a good point. Thank you. I didn't think about that. That's good.

Particularly when we're talking about groundwater. Good suggestion.

MR. SAUNDERS: Did we answer all your questions? Was there anything else that we skipped over?

MS. TUTT: Record of public notices, is that in the repositories or only here at JPL?

MR. SAUNDERS: That type of information is put in the information respository. Public notice for the meeting would be put in there.

Any other questions or comments from the public? We welcome this opportunity to hear from you. Anyone else?

Well, there is another opportunity if you think of further questions that you'd like to ask. We are having another public meeting on Monday night, and that information is also in that proposed plan fact sheet and the times. And the public comment period is continuing on.

Again, I want to thank you for attending. I encourage you to review and comment on the proposed plan. Final decisions regarding cleanup will be made after your public comments have been received and considered.

The public comment period started on May 7th and runs through June 11th, 2001. If requested, NASA may consider extending the public comment period. Written

comments, and request for extension of the comment period should be mailed or E-mailed to Peter Robles, and his address is in the fact sheet, and it's also up here on the slide here.

If there's nothing else, no other comments, any last statements from our representatives up here, I thank you for attending this afternoon and have a good evening.

Oh, yes. And there will continue to be the representatives here who will be available after the meeting if you want to do follow-ups or ask any further questions. And, again, if you think of a question after we've officially closed this meeting, feel free to write it out on the comment sheet and submit it to our court reporters and such so they can include it in the public record.

Thank you.

(Whereupon, at 4:00 P.M., the HEARING was adjourned.)

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STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

I, Vickie Blair, Certified Shorthand Reporter, number 8940, RPR-CRR, for the State of California, do hereby certify;

That the foregoing transcript is a true record of the proceedings.

I hereby certify that I am not interested in the event of the action.

IN WITNESS WHEREOF, I have subscribed my name this 4th day of June, 2001.

Certified Shorthand Reporter for
the State of California

PUBLIC MEETING AND PUBLIC COMMENT PERIOD

SATURDAY, MAY 12, 2001

1:00 P.M.

VON KARMAN AUDITORIUM

NASA JET PROPULSION LABORATORY

4800 OAK GROVE DRIVE

PASADENA, CALIFORNIA

PASADENA, CALIFORNIA
SATURDAY, MAY 12, 2001; 1:00 P.M.

MR. SAUNDERS: Good afternoon. Welcome to the Jet Propulsion Laboratory. Thank you for taking the time to attend this meeting on a Saturday afternoon.

My name is Lee Saunders. I'm an environmental public affairs officer for the U.S. Navy and your facilitator for today's meeting about the proposed plan to select a remedy to clean up soils at the National Aeronautics and Space Administration Jet Propulsion Laboratory, located here in Pasadena.

Prior to this meeting you had the opportunity speak to NASA, federal and other local regulatory agency representatives on a one-on-one basis about the proposed cleanup actions. During this portion of the meeting you, the community, can provide questions and comments to these representatives and their agencies on the proposed plan. These comments and questions will be included in a meeting transcript and become part of the final decision made for soil cleanup at JPL.

Representing the agencies responsible

for the cleanup and talking to you about the proposed plan and its remedial alternatives are agency representatives, who will each introduce themselves, starting from my left here.

MR. ROBLES: Peter Robles from NASA.

MR. ZUROMSKI: Richard Zuromski from the Naval Facilities Engineering Command.

MR. GEBERT: Richard Gebert from the state of California Department of Toxic Substance Control.

MR. RIPPERDA: Mark Ripperda from the U.S. EPA.

MR. YOUNG: David Young from the Los Angeles Regional Water Quality Control Board.

MR. SAUNDERS: And all these representatives are what we call remedial project managers that are responsible in one way or form in the cleanup of this particular site.

Ground rules, I want to talk about ground rules for today's meeting, are as follows: This afternoon's format will consist of presentations by our representatives about the proposed plan and remedial alternatives, followed by a formal comment session where you, the community, can provide us with your comments and questions.

I'm going to ask you to please hold your questions until the presentations have been completed. Once we've heard from all the presenters we will open the floor for questions and comments. You may want to use the sheets of paper that were distributed, comments sheets, to write down your questions during the presentation, in case you have some questions that you develop and you just feel you can't wait until the time comes, but that will help you keep track of what those questions are.

To ensure that everyone that wishes to make a comment or ask a question has a fair and equal opportunity do so, we ask that you limit your comments or questions to two minutes. At the end of that time please take your seat. If you have not finished your remarks, you may continue for another three-minute period after we've heard from all the other speakers.

We have a court reporter -- actually, we have two court reporters here today, so we ask you to please state your first and last name and spell your last name before you begin your comments or questions.

If you do not wish to provide verbal comments or questions, you may also submit your

comments and questions in writing. There are comments sheets, as I just mentioned a moment ago, available on the tables in the back for those of you in the audience that would prefer not to give your input or comments verbally at this meeting.

For those of you wondering why the U.S. Navy is involved with the environmental cleanup of a NASA facility, the explanation is fairly simple. In 1999 NASA and the Naval Facilities Engineering Command, who I work for, more commonly known by the acronym NAVFEC, reached a memorandum of agreement establishing roles and responsibilities that state that NASA may procure environmental engineering and consultancy services from NAVFEC and its subordinate commands. In late 1999 NAVFEC became heavily involved in providing environmental services to NASA JPL.

Peter Robles, remedial project manager from NASA, is our first presenter.

Peter?

MR. ROBLES: Good afternoon. First thing we want to talk about is our presentation. What we have -- going to present this afternoon is a site description, regulatory framework, site assessment and investigative activities and our

remedial activity and proposed remediation alternatives. In other words, we're going to go and follow along what the booths in the back are, in sequence, so that you can get a feel for the total history of this site.

Site description. The site has been active since the late '30s to early '40s. It was part of a project out of Cal Tech. The Army ordinance took over the site in the '40s and became the owner of the site and work was done here for the Army ordinance service, particularly during the World War II era.

At that time during the '40s and '50s, the proper and acceptable way of disposing of chemicals was done through what we call seepage pits. Seepage pits are no more than bricks without the binding between them, so that things can seep out into the ground through them. At that time it was accepted. Most of that was working on propulsion systems to support jet aircraft, we call JATO, genesis to take-off rockets, also reverse engineering of V-II rockets for World War II and further on.

During the late '50s, early '60s the Army ordinance was working and negotiating with NASA

and NASA took over the site in 1959, 1960, at which time what we did was we replaced the seepage pits with a sewer system so, therefore, we could stop that type of activity. Up until that time there was not a problem with the ground or soils in the area, but in '92 was when the concern came about and we were placed on the national priorities list by EPA.

And at that time that made us a Superfund site, which is what the process that we have been talking about these last couple of hours with you. That process started in October of '92, we signed a federal facility agreement and the process started for us to investigate the site.

Current activities right now is that all of our operations meet federal and state and local regulations. And by the way, I was told by our people to say this, that almost all, very small percentile is ever sent through disposal. We recycle and destroy as much as we can. The effect is, this facility is the best in NASA for recycling materials and chemicals that are used here. And we do a lot of research here but we meet all federal, state and local requirements so current operations is not a concern. We're talking about past acceptable practices that we are trying to

remediate.

Here is the site description of what we're talking about and here is the gist of the problem. Because of the seepage pits and the stuff that was put in there, they slowly, and it takes years to migrate through the soils and to reach the water table.

Our biggest concern is between 50 feet below the surface all the way down to 200 feet, and the main purpose of our discussion today is to talk about remediating what we call Operable Unit 2 vadose zone. Vadose zone is an engineering term for just the soils between the surface to the water table.

We want to remove this source, so that it stops migrating and impacting the environment. And that's what our focus is today about, minimizing that, removing that and we have certain technologies that we have tried.

NASA will address the groundwater issue. In the future we plan another meeting like this next year, to talk about remediating groundwater Operable Unit 1 and 3, but today we want to focus on the soils.

And now I would like to turn this over

to our regulatory framework speaker, which is ...

MR. RIPPERDA: Thanks, Peter.

I'm Mark Ripperda from EPA and I'm kind of speaking for all the regulators, for Richard and David who are here from the state of California.

But first I would just like to ask that all of you from the public go home, tell your friends -- tell 10 friends each how fun this is, how much you learned and tell them that they have to come back on Monday night.

So what does it mean to be a Superfund site and, for that matter, what's Superfund. Congress, about 20 years ago, passed a law that put a tax on the chemical industry, and that money from the chemical industry all went into a trust fund that's called the Superfund, that EPA is authorized to use to spend to clean up abandoned hazardous waste sites. That same law also gave EPA the authority to go after existing facilities, such as NASA JPL, that have had releases that need to be cleaned up.

But before you become a Superfund site you have to go through a ranking process. EPA evaluates how bad the site is, how bad the potential

risk might be and, if you score high enough, you're put on the national priorities list, which that means you're a Superfund site. And right now there's about 2000 or so Superfund sites.

So after the discovery of the release, and for NASA JPL that meant that the city of Pasadena found chemicals in their drinking water wells -- I'm not sure which way is east or west here -- over this way, right across the arroyo, the city of Pasadena has some drinking water wells, and they found levels of chemicals in there that were high enough that they needed to be -- to put a treatment system on them. At that time all that information -- started at EPA, we rank it and we say okay, this needs to be a Superfund site.

But the first thing that happened is, that as soon as the city of Pasadena found those chemicals they put treatment systems in, NASA had to reimburse the city for that, and then NASA needs to start looking at their site and say -- and determine where those chemicals came from, how much there might be and how best to clean it up so that the groundwater in the future is not getting either more contaminated -- and in fact we can start to clean up the groundwater itself.

So to do that, we do what's called a remedial investigation and feasibility study. That means we look through all the records, what kind of chemicals are used on-site, drill -- NASA drilled bore holes all over the site, they drilled monitoring wells that gets down to the groundwater both on site and off site, they sampled drinking water wells from all over the area to try to determine the extent of the problem and to design a way to best clean it up. And that brings us to about where we are now, for the vadose zone soil.

So NASA JPL completed the investigation of the soil zone and they're making a proposed plan to you, to the public, saying that, you know, we think we understand the problem, we think we know the best way to clean it up and what do you think? Both what do you think of what we've done and what do you think of what we, NASA, not the EPA, is saying on how to clean it up.

You know, so if you do have any -- not just questions, but if you have any comments on what they're proposing, you know, please make those either today or, after the meeting, in writing. You know, let NASA know what you think.

At that point NASA needs to respond to

all those comments. They'll do a written response that gets sent out to the public, it gets sent to the regulators, state of California people and, you know, we at EPA review NASA's response and say either yeah, you did a good job responding or not.

And if everybody agrees that, you know, this is the best way to go, then they'll do an actual legal document, called a record of decision, where they say this is what we're selecting to do and then, from there, they actually design the system. Right now they have a rough idea, you know -- if you've been talking to us back there, you know that they're planning to put in about five bore holes. And that's not set in stone, that's, you know, an estimation of what we think will be best.

Actual -- after public comments are received and the record of decision is signed, then there are contractors who will do a more detailed study, and it will probably be about five bore holes, plus or minus a little bit, but they'll do the actual details of the design. And after the soils are cleaned up, there will still be long-term monitoring to make sure that the remedy actually worked.

And all of this is separate than the

groundwater system which, as Peter said, will be addressed in -- in six months to a year there will be another meeting, with another proposed plan on how NASA plans to clean up the groundwater.

And -- kind of like I already said, the whole point of this is just to get the public involved. So please tell your friends to come, tell people you live near what's going on and, you know, give us any comments or concerns you might have.

MR. ZUROMSKI: Tell them about the cookies.

MR. RIPPERDA: And eat the tablefull of cookies.

MR. ZUROMSKI: Thank you, Mark.

I think I talked to some of you. My name is Richard Zuromski, with the Naval Facilities Engineering Command, and I'm here today to talk to you about the site assessment and investigation activities that have been done here at JPL and, also, what we're proposing as a remedy for JPL OU-2.

First I'll start out with the remedial investigation. From 1994 through 1998 JPL conducted a remedial investigation in over nine sampling events, different sampling events. They looked at

45 soil vapor wells, 35 soil borings and three test pits. Now, they also, at the end of that remedial investigation, established 37 permanent monitoring points for soil vapor, that we monitor on a quarterly basis. So we are continuing to monitor the extent of VOCs in the soil to date, on a quarterly basis.

The samples that we took during the remedial investigation identify the extent to which the chemicals were found in the soils. The results showed that there were elevated levels of four different chemicals in the soil vapor. These four chemicals were carbon tetrachloride, trichloroethene, Freon 113 and 1,2-dichloroethylene. These chemicals are chemicals that are used as cleaning solvents when they used to test the old rocket motors here, back -- as Peter was saying, back in the '30s, '40s and '50s they used to clean out the rocket motors with these solvents, and that's how they came into the ground here OU-2.

Secondly, I want to talk to you today about the OU-2 risk assessment. The human health risk assessment found that there were no risks above regulatory thresholds from exposure to humans to

soils or soil vapor. Now as Peter mentioned earlier, the main reason is that these chemicals are more than 50 feet below the ground surface, where we are today. So it's really very, very unlikely that any of you will come in contact with those chemicals.

However, also as Peter and Mark mentioned, there is a risk that these chemicals will continue to migrate, they've already migrated 50 to 200 feet down and will continue to migrate to the groundwater, and that is the purpose of the remedy that we're proposing here.

Now, we are currently studying how we're going to remove the VOCs from the groundwater and, as mentioned earlier, that is going to be the subject of another public meeting, almost exactly like this, in the near future. However, in the meantime, again to reiterate what Peter said, there isn't a risk from the chemicals in the groundwater because your water purveyors, or the individuals who have to deliver the water to you, have to meet very strict regulatory requirements.

But today's -- the focus of today's meeting is looking at how we're going to remove what we're calling -- we're calling source removal, is

how can we remove the chemicals that are in the soil that may potentially continue to migrate into the groundwater, and that's what we're looking at today.

Now, this graphic shows the extent to which VOCs at any level, whether that was a very, very small level or a high level, were found at JPL during the remedial investigation. Now, to date, I don't know how many of you had a chance to look back at our table back here, but the size of this area is smaller to date. And so if you are interested, please, take a look. But this was during the 1994 through the 1998 remedial investigation.

The highest levels -- like I said, this is the extent of all levels that we have -- we found during our remedial investigation. However, the highest levels that we found were here, in the north central part of the site. That's where most of the lab activities were taking place at the time.

Now, based on the results of what we did in the soil investigation and the remedial investigation, and also our continued quarterly monitoring program for soil vapor, we have found that, as I said, the VOC vapor plume has not

migrated in soil vapor off the site. This is about the limit, it's about 45 acres here on the site in soil vapor. So it hasn't gotten any bigger than this.

And, again, I encourage you to take a look, after the formal presentation, at some of the other documents that we have in the back, which will show you some of the more current conditions.

Now, like I said, based on the analysis of the remedial -- during the remedial investigation, the remedial objective for OU-2 is to prevent VOCs from migrating to the groundwater. That's our objective here. To meet this objective, we looked at several alternatives and these were investigated, what is called -- what Mark called earlier the feasibility study. Of these alternatives, two were selected for a very detailed evaluation, as mentioned in the proposed plan that was sent out. Others were looked at and, for example -- but just weren't found to be feasible. For example, it would be very infeasible to try to dig out soils underneath all the buildings here at JPL that are more than -- that the soils are more than 50 feet below the buildings here on site. So we wanted to look at two alternatives that were --

in detail, that we wanted to make sure were viable alternatives for cleaning up the site.

The first is no further action. This is a default that is used to compare all other technologies to. It would involve maintaining our quarterly soil vapor monitoring program and any possible natural degradation of the chemicals in the soil -- in the soil vapors.

The second is soil vapor extraction with granular activated carbon treatment. Now, this technology would involve installing you to five soil vapor extraction wells and five extraction systems or treatment systems, and also continuing the ongoing quarterly soil vapor monitoring program here at JPL.

To help us evaluate the technologies and the alternatives, we conducted a pilot study of the soil vapor extraction technology at JPL, starting in 1998. Again, some of the results from our pilot study are available at the tables in the back. But what it showed, in over 14 months of operation, we removed over 200 pounds of these chemicals from the soil.

Now, it was so effective during our pilot study, that we have -- we do continue to

operate the pilot study to date, and it does continue to remove the chemicals from the soil vapor to date.

Now, this is a conceptual drawing of how soil vapor extraction works. Now, let me point out some of the details of this diagram. It is fairly simplified but it does give you a good picture of how soil vapor extraction works.

First, here, this is from -- these are the past seepage pits that were used back -- as Peter said, back in the '30s and '40s that released VOCs into the soil and soil vapor. These VOCs are basically -- it's like a vacuum. The soil vapor extraction system is like a vacuum that sucks these soil vapor, the chemicals, into this extraction well, right here, and extracts the vapors, in a gaseous phase, to the surface through this little pump. The pump then sends the chemicals into the vapor treatment system.

Now, the vapor treatment system consists of granulated activated carbon. What it does, it's -- actually, it is like charcoal. What it does is, when the vapors, with the chemicals, go through the carbon, they bind to the carbon and they stay permanently in the carbon and clean air is

released from the system. So, basically, all of the chemicals that are sucked from the ground through the system remain in the vapor treatment system and are permanently removed from the soil vapor.

So, based on our analysis, based on the remedial investigation, based on our soil vapor extraction pilot study, Alternative 1 was not chosen because it just doesn't prevent the migration of VOCs to the groundwater. Therefore, the proposed alternative for OU-2 is soil vapor extraction.

Soil vapor extraction will be used to reduce the source of the chemicals in the soil vapor, so that they do not migrate to groundwater. It would permanently remove them from the soil vapor, through the system.

VOC -- excuse me. Soil vapor extraction works very well for several reasons. First, number one, it permanently removes the VOCs from the soil vapor.

Number two, it works very well in the types of geology and soil that we have here at JPL, and that was shown during our pilot study.

Third, it protects the groundwater from further migration of these chemicals through the soils.

Fourth, the treatment period is relatively short, probably from one to five years, operating these types of systems.

And, finally, because of these advantages and because soil vapor extraction has been so successful not only here in our pilot study but at sites all over the country, it's given the name "a presumptive remedy" by the United States Environmental Protection Agency. What a presumptive remedy is, it's the most effective technology for conditions similar to JPL as was seen at sites tested throughout the country. And that's another main reason why we're proposing soil vapor extraction for OU-2.

Based on the pilot study data, based on the results of the remedial investigation and ongoing quarterly monitoring, we are proposing soil vapor extraction as the proposed alternative for JPL OU-2.

Lee?

MR. SAUNDERS: Thank you, Richard.

We're now going to go into the comment phase, comment and question phase of this meeting. As a quick reminder, to ensure that all participants' comments or questions are received --

receive equal treatment, please limit your comments and questions to two minutes. We also ask you to please state your first and last name and spell your last name for the court reporters.

Thank you.

Do we have any speakers that would like to comment or ask any questions? Please step up to the mike.

Don't be shy.

Any questions or comments that you want to submit to the court reporters in writing?

Yes, ma'am. Would you step up to the mike, please.

MS. TUTT: My name is Elaine Suzanne Tutt and my last name is T- as in Thomas -u-t-t as in Tom, and I'm a resident of Altadena, and I also work here at JPL.

Yeah. What I would like to ask is for the alternatives, there's alternative one and alternative two, and it seems like alternative one is not really an alternative but it's just continuing not to do something. If I'm wrong about that I'd like to be corrected. And so alternative two is to pursue the soil vapor extraction.

And it -- it's interesting. I

appreciate the description that was given today. I wonder if some folks from either the Navy or maybe someone -- the fellow from the EPA could tell us more about some other alternatives that were considered for this.

Also, my other comment is, that I just received the notice, an invitation to this meeting, today, May 12, and the meeting -- I just received it in the mail today, May 12, from the post office in mail box here in Altadena, and today -- the meeting is also May 12. So I'd like to comment that this is not soon enough before the meeting to be able to get people over here and tell people about what an interesting meeting this is.

I think that if we would have known about it a little more in advance, it would have helped.

MR. SAUNDERS: 30 seconds.

THE FLOOR: Thank you.

It would have helped to get more interested community members out to the meeting. So I just wanted to just pass that along. I would think that at least 10 days would be the minimum that you would let us know in advance of the meeting.

Thank you.

MR. RIPPERDA: I'll say something from EPA's perspective on your question on alternatives. And I also -- I agree with you about the short notice. That's inexcusable on our part, on NASA's part. I'm not sure why it happened that way, it wasn't supposed to. These things were supposed to be mailed out more than 10 days ago. So we screwed up, and I have to take responsibility for that, too, because I'm supposed to be overseeing what NASA's doing to make sure they do it right.

But back to the alternatives.

It does look like, you know, NASA is not giving anybody very much choice. They're giving you alternative one and alternative two, and alternative one is essentially do nothing. But in a -- we talked about this, actually, before the meeting, saying, "Wow, you know, we're not giving people much choice here." But it's what Richard said about a presumptive remedy.

In a case like this, soil vapor extraction has been used at thousands of sites around the country. It's been the one and only technology that's proven to work consistently at sites like this.

You know, there's other things you can do. You can dig up the whole site, but EPA doesn't require a facility to investigate obviously ridiculous choices, such as digging up the entire site.

But there's other things that you can do, like injecting steam to make it be cleaned up faster. That would be called innovative technology. But we don't really require that a facility look at things like that, that would cost so much more, when an off-the-shelf technology works so well and relatively quickly.

So even though it looks like there's not really much choice here, it's because NASA is following the process that's set in law by Congress that they're supposed to look at alternatives, but we've been doing this long enough that the alternatives boil down to, in some cases, some very few or, in this case, only one real alternative.

Congress makes us look at no further action just as a baseline, to make sure we're not out there spending money willy-nilly. And other than that, the way the law is written by Congress, we're supposed to look at viable alternatives.

And in this case, we have enough

experience to know that soil vapor extraction is actually the only viable alternative. But we're still supposed to do it in this way when we go to public with our various alternatives that NASA is proposing.

We haven't changed the process, even though we've learned enough to know that there actually is only one real alternative here.

So I don't know if NASA wants to say anything.

MR. ROBLES: Just because it's SVE now doesn't mean that if, in the future, new technology comes in that we find better that we won't revisit this. This is not like cast in stone right now.

So I want to assure the public that as technologies develop, we are required through the process to periodically review what we're doing and, if we see some thing better, and if an issue comes up that we want to augment the SVE with another technology that has appeared to be better, that's what we do.

So as the technology improves, one of the things -- I've been in this business for 30 years. One of the things that amazes me is the regulations are always set forth before the

technology catches up. But as technology improves, we in the environment community can say, "Okay, look, this new technology might be better been SVE, so let's replace or let's augment."

So don't think that this is it. We're only going to do SVE and that's it, we've lost the opportunity. We're required through the process, and Mark is always on my case about this, is to make sure that the technology matches what we need to do. And so we're going to revisit this. This is not cast in stone.

We have meetings quarterly and we will discuss this, and we will have information meetings in the future because we still need your inputs. So as we go on, hopefully we'll find some technology with the silver bullet that will clean everything up. We hope. Some day. But until now we have to use what we've got.

MR. ZUROMSKI: I just want to make two quick comments just to clarify what Peter said, as well.

It's true that every five years we do what is called a five-year review once we sign the legal document that Mark talked about called the ROD, the record of decision. So every five years we

do review what we've done and, again, see if we're doing the right thing.

And, secondly, as I think was mentioned today, this is the proposed alternative, as well. The opportunity here is that we are presenting, though limited, but what we think is the best tentative, we do encourage your comments as to what you think if this is the best alternative. And that's why this part of the process involves public comment.

So thank you.

MR. SAUNDERS: Any other comments?

And just a couple of comments I wanted to make was, we did mail these out on Tuesday, May 8. Obviously, it wasn't enough time, so we'll definitely make sure that we mail these farther in advance, to get out to you in plenty of time to plan to attend the meeting.

And one other comment, as Richard is basically saying, is the purpose of this meeting is you can come here and provide some alternatives that you feel might be useful to add into the record, that we can consider in the future.

Are there any other comments or questions from the public?

Yes.

MS. BLAIR: My name is Susan Blair, B-l-a-i-r. I'm also an Altadena resident. Mine's a curiosity question. Once the gases come up through the pipe into the chamber where the carbon is and it absorbs the chemical, what happens to those carbons?

MR. ZUROMSKI: What happens is, once the carbon becomes full of all the different chemicals that we are pulling from the soil vapors, we have to, as Peter stated earlier, in accordance with all the state, local and federal regulatory requirements, take that carbon canister, remove it, and then it's either recycled or incinerated or somehow disposed of in a very legal manner off-site. And then we then replace the carbon with brand new carbon and it continues the process again.

MS. BLAIR: Thank you.

MR. SAUNDERS: Do we have any other comments or questions from the public?

Yes, ma'am.

MS. COMPTON: Cynthia Compton, C-o-m-p-t-o-n. I'm an employee of JPL and interested community member. I have a few

questions, so I'll just plow through them in my two minutes.

You said that in the '50s to the early '60s a sewer system replaced the seepage pits. Does that mean the chemicals are now going into the sewer system, and where do they go from there?

Other questions I have are: Is there a record of what other alternatives were considered other than these one and two, and where can we read or find out about that?

And it says the pilot system has removed 200 pounds of VOCs. Out of how many is predicted or known to be at the site?

It says the -- I think the -- what I'm hearing is that the VOCs are in the vapor or the pockets of the soil. So what about the soil itself, and all the VOCs in the soil particles, and, you know, once you remove it from the vapors does it now migrate from the soil particles back into the vapors afterwards?

And I also agree with the short notice to the public, and that's why there, in my opinion, are not adequate representation from the community here. I got the e-mail notice on Wednesday and

didn't really see it until Friday, about 6 p.m. on Friday. And I would like to know: Is there some kind of record of when notices are sent out to the public and where they're at.

And the other thing is, I think I was talking to Richard about who these notices are sent to in a half a mile radius from the site. What about -- I understand sending it another half a mile to get more public is maybe too many -- you know, too costly, but what about sending the notice to the customers --

MR. SAUNDERS: Time.

MS. COMPTON: -- of the water companies that are involved?

MR. SAUNDERS: Thank you.

Quite a few questions, and we'll try to address those one at a time.

MR. ROBLES: Good questions.

On the first one is, we do not send chemicals down the sewer system. What happens is we try to recycle them. They're usually used up in the processes. If we can't recycle them, we try to destroy them in some form of fashion. The regulations try to minimize sending stuff down the sanitary sewer. We're very particular about that.

I don't know if you've seen around the lab these circles with the ducks on it because they're saying this is a storm water drain, this is sanitary sewer. We don't want chemicals going down there. That's part of our regulation. We have a whole office on-site to manage that. So that's not going down there. That's one of the reasons.

The second -- well, I'll answer your last item on the notices. There is repositories in the local area, the libraries, that you can get these documents, and there is on the record of when we sent the notice. And we apologize. We had a little SNAFU. But we had sent 4,732 mailers.

Now, I have received some phone calls that people did receive them by Monday and Tuesday of this week, but there was a slight mix-up where you might have been the ones that didn't get it until later. We did send the e-mail out -- I don't know what happened. Well, we want to send it earlier, so that's a good comment. We're going to have to notice -- I think we're going to have to send them more than 10 days earlier, to make sure that the mail -- because there was some problems with some of the post offices in sending this stuff out, so we want to make sure it does.

We also put it in the paper. We put it in the four local papers and L.A. Times. But I also notice that some people didn't see that, so we might have to augment in the future. So we have to be creative about which way -- do you guys listen to radio? Or -- might that be a better way? I'm just asking. Because we're trying to get more items out, and that's why we have two meetings.

So if you could tell the public. You know, I apologize. Come out Monday. I would love to see 100 people here, or more. But we have sent 4,732 of mailers, plus the 6,000 JPLers who were contacted.

Okay?

MR. ZUROMSKI: I think I'm going to address the other two of them. I think Peter covered lot of yours.

The first is, if you do want to see the other types of technologies that were evaluated, that is in the feasibility study and that is available at all of the document repositories. And that shows you the detailed analysis, like I talked to you about earlier, that we go through to evaluate the technologies. And it will show when certain things were dropped out and when certain things were

retained. And it is very detailed, it is about three -- three inches, four inches thick, but it is very easy to look at. So feel free, it's at all the document repositories.

The second question I think I'm going to answer is, the amount of chemicals that are in the soil vapor and how they move around.

There are different ways to -- technically, to estimate how much is in the soil vapor. I can't get into every little detail of how that is done. Again, that is in the feasibility study as well. But there is an estimate of somewhere between three to five thousand pounds, 5,000 being the maximum that we believe could be in the soil vapors, and that also includes what would be in the soils.

When we say "soil vapors," since they are volatile organic compounds they tend to be in a vapor state, and so that is why we are removing soil vapors by soils themselves.

Anybody?

MR. RIPPERDA: I'll add a little bit to that. That's actually a great question about soil vapor versus soil, and what Richard said is right, but I'm just going to add a little bit.

We estimate, or NASA estimates, that there's up to about 5,000 pounds total of these things, and that's total in the soils, absorbed in the soils and in the soil vapor.

When it's located like it is, 50 to 200 feet below the surface, you actually have to drill a well, a bore hole, to get down to it. And the act of drilling that bore hole and taking your sample, you can't -- it drives the VOCs out of that piece of soil. So you can't just take a sample of the soil and analyze how much is in the soil. It's just not very effective. So what we do instead is, we measure what's in the soil vapor. It's very easy. You drill your same bore hole, suck some air in, and that volatilizes it off the soil.

So we're being somewhat legalistic when we're always saying the VOCs in the soil vapor, because that's where we actually measured it, and that represents how much is actually in the soil. And there's various equations that you can use, based on the soil chemistry with partitioning coefficients and things like that, to calculate from what you have in the soil vapor back to what's in the soil.

So just because we always say "soil

vapor," that doesn't mean we're only looking at the vapor. What we really care about is what's in the soil and about any rainwater that might migrate through that soil, deabsorb it, and carry it down to groundwater.

MR. SAUNDERS: Any other feedback from our representatives?

MR. ROBLES: Did we answer all your questions, ma'am.

THE FLOOR: What about when you remove the VOCs from the vapors, as more chemicals evaporate out of the soil into the --

MR. ROBLES: Right. That's why you constantly do that. The question is -- there was one question that she had asked, once you remove the particles through the vapor, are there any particles left on the soil.

This is a continuous process because you want it to volatilize that material because it's a volatile organic. So you want to draw it out. So you constantly are pulling pressure and putting a vacuum on it to suck it up. Eventually there should be no particles left there.

I'd say no, because any system cannot 100 percent clean. You can't get the last molecule

out. What you're trying to do is get as low as possible until the technology doesn't work anymore. And then you wait for another technology, where you say, "Hey, we're kind of finished, and there is no more threat to the groundwater." And that's what you do on it. It's not an exact science, we try our best, and that's what we do.

And that, like I said, the document, as Richard said, is thick. It has everything in there that you want to know. And if it's not in there, we'll have informative meetings and we can give you the boring lecture. Because this is -- it's long. And to read these documents right now, at -- once we finish this process, sometime in the future, we're going to have so much documents that you will not believe. I mean, we generate so much information. This process requires of the government to do this, to make sure that we make the right decision. And we have to publish these documents so you, the public, can read them and say, "How did you guys make that choice?" That's what we call the administrative record, and that's why we have that in the repositories for you.

MR. SAUNDERS: I don't know if it was mentioned, in the proposed plan, the information

repositories are located on, if you want that information, on page 6 of the proposed plan. That's the different information repositories.

The item of record, I believe, is kept here? At JPL?

MR. ROBLES: There's three.

MR. SAUNDERS: Okay.

And, again, what you're telling us tonight is very useful, this evening, because we need this feedback. I believe this is the first time that you've held a public meeting here, so this is a learning process for NASA, for all of us, and we appreciate this feedback that you're giving to us. It will help us make meetings better in the future, to communicate information to the public better.

Yes, ma'am.

MS. COMPTON: The only question that wasn't answered is have you considered sending these public notices to the customers of the water companies that are impacted.

MR. ROBLES: Thank you.

We have a representative here. I'm not going to put him on the spot.

We meet with the Raymond Basin

Management Board. We have dialogue. We are meeting with the city of Pasadena on Monday. The water purveyors know about these meetings, and we have told them in their board meetings and the word has gotten out that way. We have gone to local communities like, I think, Northeast Trees and a few others. We've told them about this.

We are looking to expand our mailing list. So if you can recommend some groups or people that you want to put on the mailing list, please let us know. Because we have no fear of sending as many as it takes, so that the public -- normally , believe it or not -- I've been in this business 30 years, and I've only been at one public meeting where it was standing room only, and that was because there was -- the government needed to expand a bombing range. You know how controversial that was. But most of the time people get their information through the newsletter, or they call up, or they go to the repositories. But if you have any suggestions of people that you want on the mailing list or groups, please let us know. But this information has gotten out to the purveyors of water.

MR. SAUNDERS: I believe what you're

referring to is like when --

MR. ROBLES: Oh, the customers? You mean the water customers?

MS. COMPTON: You and me that are drinking the water and paying the purveyor to send water to our houses.

MR. ROBLES: Oh, so you're asking should we send these to all the people that get the water.

MS. COMPTON: All the customers who live within a half mile radius.

MR. ROBLES: That's a good point.

MR. SAUNDERS: I think, also, the point you may be making, and I may be wrong about this, but when utilities have public hearings and such, they usually include a public notice in their mail-out, in the billing. And, of course, that is their mailing, it's not ours. So we would have to approach a utility to do that. Whether they would do it for free or charge us, I don't know, but that's something we would have to discuss with the appropriate utility.

MR. ROBLES: Right. That's a community right to know.

That's a very good suggestion, that

when we're going to talk about groundwater it might be a good thing is to go and talk to the purveyors and see if we should send those notice -- that's a good point. Thank you.

MS. BLAIR: The Lincoln Avenue Water Company, every member of the Lincoln Avenue Water Company is shareholder, so they have the right to know that.

MR. ROBLES: That's right. That's a good point. Thank you. I didn't think about that. That's good. Particularly when we're talking about groundwater. Good suggestion.

MR. SAUNDERS: Right.

Did we answer all your questions? Was there anything else that we skipped over?

You had around six questions.

MS. COMPTON: Record of public notices. Is that in the repositories or only here at JPL?

MR. SAUNDERS: That type of information is put in the information repository. The public notice for the meeting would be put in there.

Okay. Any other questions or comments from the public? We welcome this opportunity to

hear from you. Anyone else?

Well, there is another opportunity, if you think of further questions that you would like to ask. We are having another public meeting on Monday night, and that information is also in that proposed plan fact sheet, with times. And the public comment period is continuing on.

Again, I want to thank you for attending. We encourage you to review and comment on the proposed plan. Final decision regarding cleanup will be made after your public comments have been received and considered.

The public comment period started on May 7 and runs through June 11, 2001. If requested, NASA may consider extending the public comment period. Written comments and requests for extensions of the comment period should be mailed or e-mailed to Peter Robles, and his address is in the fact sheet and it's also up here on the slide here.

If there's nothing else, no other comments, anything -- any last statements from our representatives up here, I thank you for attending this afternoon and have a good evening.

Oh, yes. And there will continue to be -- the representatives here will be available

after the meeting, if you want to do follow-ups or ask any further questions. And, again, if you think of a question after we've officially closed this meeting, feel free to write it out on a comment sheet and submit it to our court reporters and such so they can include it in the public record.

Thank you.

CERTIFICATE

I, LESLIE A. MAC NEIL, RPR, CSR No. 7187, in and for the State of California, do hereby certify:

That the foregoing ___-page proceedings were taken down by me in shorthand at the time and place stated herein, and represent a true and correct transcript of the proceedings.

I further certify that I am not interested in the event of the action.

WITNESS my hand this _____ day of _____, 2001.

_____

Certified shorthand reporter in and for the State of California

PUBLIC MEETING AND PUBLIC COMMENT PERIOD

JET PROPULSION LABORATORY

PASADENA, CALIFORNIA

MONDAY, MAY 14, 2001

6:00 P.M. to 9:00 P.M.

Reported by:
Vickie Blair
C.S.R. No. 8940, RPR-CRR

PASADENA, CALIFORNIA; MONDAY, MAY 14, 2001
6:00 P.M.
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MR. SAUNDERS: Good evening.

We're going to start a couple minutes early. Welcome to the Jet Propulsion Laboratory. Thank you for taking the time tonight to attend this meeting.

My name is Lee Saunders. I'm an Environmental Public Affairs Officer for the U.S. Navy and a facilitator for tonight's meeting about the proposed plan to select a remedy to clean up soils at the National Aeronautic Space Administration, Jet Propulsion Laboratory located here in Pasadena.

During this portion of the meeting, you, the community, can provide questions and comments to these representatives and their agencies on the proposed plan.

Excuse me. Let me backtrack just a moment.

Prior to the meeting, you had the opportunity to speak with NASA, federal, and local lead and regulatory agency representatives on a one-to-one basis about the proposed cleanup actions.

During this portion of meeting, you, the community, can provide questions and comments to those representatives and their agencies on the proposed plan.

These comments and questions will be included in a meeting transcript and become part of the final decision for soil cleanup at JPL. Representing the agencies responsible for cleanup and talking to you the proposed plan and its remedial alternatives are agency representatives who will each introduce themselves.

To my left -- do you want to --

MR. ROBLES: Oh, Peter Robles of NASA representing the SuperFund cleanup here.

MR. ZUROMSKI: Hi. I'm Richard Zuromski with the Naval Faculties Engineering Command.

MR. GEBERT: I'm Richard Gebert with the State of California Department of Toxic Substances Control.

MR. RIPPERDA: I'm Mark Ripperda with the United States Environmental Protection Agency.

MR. YOUNG: I'm David Young with the Los Angeles Water Regional Quality Control Board.

MR. SAUNDERS: Ground rules for today's meeting are as follows: This evening's format will consist of presentations by our representatives about the proposed plan and remedial alternatives, followed by a formal comment session where you, the community, can provide us with your comments and questions.

I'm going to ask you to please hold your questions until the presentations have been completed.

Once we've heard from all the presenters, we will open the floor for questions and comments. You may want to use the comment sheets that are in the back to write your questions down during the formal comment session while we're waiting for opportunity.

To assure that everyone that wishes to make a comment or ask a question has a fair and equal opportunity to do so, we ask that you limit your questions or comments to two minutes. At the end of that time, please take your seat. If you have not finished your remarks, you may continue for another three-minute period after we have heard from all the other speaks.

We have court reporters -- two of them -- here tonight, so we ask you to please state your first and last name and spell your last name before you begin your comments.

If you do not wish to provide verbal comments or questions, you may also submit your comments and questions in writing. There are comment sheets available on the tables in the back for those of you in the audience who would prefer to submit your input by this method.

For those of you wondering why the U.S. Navy is involved with the environmental cleanup of a NASA facility, the explanation is fairly simple. In 1999, NASA

and the Naval Facilities Engineering Command, most commonly known by the acronym NAFAC reached a memorandum of agreement establishing roles and responsibilities that state NASA may procure environmental engineering and the consultantcy services from NAFAC and its subordinate commands.

In late 1999, NAFAC became heavily involved in providing environmental services to NASA and JPL. Peter Robles, remedial property manager for NASA, is our first presenter.

Peter.

MR. ROBLES: Good evening. What we're going to present today is a site description to give a little history of why this site is on the SuperFund list. Then we're going to have Mark Ripperda talk about regulatory framework, coming up with Richard Zuromski talking about site assessment and investigation activities and the remedial activities and the proposed remedial alternatives for OU-2 soils.

We will, at a later date, talk about groundwater. We'll have another public meeting in the near future. But right now what we're focusing on are the soils underneath JPL and how to remediate the contaminants in the soil to minimize any migration into the groundwater. And that's what we're going to do right now.

The site that we call JPL has been active since the late '30s, early '40s. It was owned by the Army ordnance, and then it was owned by NASA in '59 to '60 when we took it over.

During the 40s and '50s, seepage pits were the main method to dispose of waste. At that time, it was the most accepted practice. It was within the regulations, no problem at all. We found out later that that was a mistake, and we had to correct that. In the late '50s early '60s, we, NASA, started programing to replace these seepage pits with sewer lines.

Now, the indication and a question that came in on Saturday was "So contaminants are going down the sewer line." No, they're not. That's a good question. Very little gets put into landfills. We usually destroy or recycle the chemicals that we use today, or they are used up in the operational processes. We do not do that. The regulatory requirements require us to make sure of that, so from the standpoint today, we are all within regulations. But at the time, the main reason why the contaminants got into the ground soil is because of these seepage pits.

In 1992, the site became a SuperFund site. It was put on the national priorities list, and the EPA will talk a little bit more about that.

We are talking about trying to remediate

Operable Unit 2, which is -- as I said, before currently all operations meet federal, state, and local requirements. We have a host of regulations that we have to follow, and so, therefore, we are assured that we're doing what's right. What we're dealing with is past practices that we have to take care of.

Here is a conceptal model of what we're talking about. What you have here is a VOC plume, volatile organic carbons, that have gone through the soils because of past practices from JPL. The area that we are most concerned with is 50 feet below the surface to about 200 feet, which is the groundwater zone that we're talking about.

In the soils, we're talking about chlorinated solvents, and when we say "vadose zone," we mean in a vapor state in the soil. NASA wants to address this issue tonight, and we will be addressing groundwater in the future.

Now we'll have the EPA talk about regulatory framework.

MR. ZUROMSKI: I just want to ask the court reporters really quick, can you hear me okay without having to use the microphone? Okay. Mark and I are going to try to do ours without the microphone then.

MR. RIPPERDA: That way I can stand out of the

light.

So what's it mean to be a SuperFund site, and for that matter, what's -- oh, I got a toy.

What's it mean to be a SuperFund site? For that matter, what's SuperFund? About 20 years ago, Congress passed a law, it's called CERCLA, and I'll talk about what the acronym means, that authorize a tax on the chemical industry. And that tax all went into a trust fund, which is called the SuperFund, which EPA can spend to clean up abandoned hazardous waste sites.

That same law passed by Congress also gave EPA the authority to go to existing, ongoing sites such as NASA/JPL that have contamination that might pose a serious threat to public health, and we have the authority to force them to clean it up.

In order for us to use that authority, we have to rank how bad the potential hazard might be, and if it scores high enough, the site is put on a national priorities list also called an NPL. And like Peter said, that happened with NASA/JPL in 1992.

So what was it that first got NASA/JPL on the national priorities list? In the late, very late '80s, the City of Pasadena found some chemicals in their drinking water wells right here across the Arroyo just through their standard compliance testing that they have to do for the

State of California. And that's what got us -- all of us regulators, the State of California, Richard, and David and myself -- well, actually our predecessors. But that got us involved looking over their shoulders making sure that they're doing the cleanup appropriately.

Right when the contamination was first sound, City of Pasadena put treatment systems onto their wells immediately, which means that anybody who is drinking the water was protected right from the beginning.

But to cleanup the actual release, to cleanup all the aquifer and the source here on the site is a long, lengthy process. And the majority of that process is called the remedial investigation feasibility study. Which means they have to go out drill bore holes all over the site, take soil samples, soil vapor samples. They have to put in monitoring wells, take groundwater samples both on the site, they also went out into the neighborhoods put monitoring wells out there, and sampled them. They also worked with the water purveyors to look at their water analyses. And with all of that, they figured out where the contamination is now, where it came from originally, and they go through the process of deciding how best to clean it up.

Usually you clean up groundwater contamination by looking at the source where the

contamination is coming from and at the aquifer itself in two separate stages because you're using a different physical mechanisms to cleanup the two. So what they're working on now, and what this whole meeting is about, is the actual cleanup of the source here on the site. So As Peter said to keep it from going into the water, which means that ultimately the water can be cleaned up faster.

So in the feasibility study, they look at various alternatives on how best to clean something up. And in some cases, such as here at JPL, there's only one real option. I don't know if you've read the proposed plan, but it looks like you were given two choices, do nothing or do what NASA wants to do. And that may look like you don't really have a choice, but Congress says that we also have to look at the do-nothing alternative because they don't want EPA out there spending money willy-nilly making faculties and industries spending money if doing nothing might work. I don't know why they don't trust us to be good stewards of public money, but they don't.

So in this case they had to look at the do-nothing alternative. And the other alternative that they show to you in the proposed plan which is called vapor extraction system is something that EPA has found over the 20 years we've been doing SuperFund cleanups to be the one system that really works in a case like this where you got

all the organic compounds in the soil deep beneath the site. You can't really dig up a site. You know, one alternative might be dig up the whole site, take the soil away. But, obviously, you can't do that here because you'd be digging up all of JPL.

There are some other technologies such as heating the soil with large electrical current, actually what is called vitrify it. So you turn it into one solid lump. You melt the soil. And you can't do that here.

So technologies like that which exist but they don't really make sense for a site, we, the government, don't make NASA do a detailed evaluation of. So we essentially cut right to the chase is that what we're proposing the one and only system that really works best now. There might be something else that comes along in the future, but for now, this is what makes sense.

So once they select a remedy, they have to do a legal document, which is called a record of decision. Before you get to that point -- I forgot the most important part, the yellow box, where we are now. We have to go out to the public and say, "This is what we're proposing. What do you think?"

So you can comment both on, you know, their selection of a remedy, but you can also make whatever comments you want on, you know, how they ran the process,

how well they've involved the public. If you think they've been hiding things from you or whatever, which they haven't, but anything you might think, you can make comment on that. It doesn't just have to be on their remedy.

They then have to respond to your comments. They have to check with the regulators, make sure that the State of California and EPA is happy with how they've responded to the public. And, at that point, if we're all happy with each other, they do the record of decision, and then they go on to the remedy implementation. And eventually, if a site gets completely cleaned up, they're no longer a SuperFund site. They get delisted from the national priorities list.

But even if that happens, there's still always going to be long-term monitoring and review of what the situation is here at JPL.

This is just kind of what we've already said. This is a chance for you to ask us questions, and also make comments on what you think about both the remedy and the process, you know, everything that's going on right now.

You can always call Peter. Peter's name and number is in the documentation you got. I don't think my phone number is there, but -- it is? Good. And you can also feel free to call me, and I'll even say feel free to

call the State of California guys if you feel like you're not getting appropriate responses from NASA.

MR. ZUROMSKI: Thank you, Mark.

Hi. My name is Richard Zuromski. I'm with the Naval Faculties Engineering Command, and, as Lee described earlier, I'm here to assist NASA in their cleanup efforts here at JPL.

From 1994 through 1998, JPL conducted what's called the remedial investigation, as Mark described earlier. During the remediation investigation, in over nine different sampling events, JPL took 45 soil vapor wells, 35 soil borings, and three test pits throughout the site to investigate where the chemicals may be found in what we're calling Operable Unit 2. Further, over 37 -- or 37 of those points were turned into permanent monitoring, soil vapor monitoring points that is we must now monitor on a regular basis to see how the contaminants are moving, or not moving, in this case, within the subsurface.

Now, during the remedial investigation, the samples identified the extent to which the chemicals were in the soil, and the results showed that there were elevated levels of four different volatile organic compounds. They were carbon tetrachloride, trichloethene, Freon 113, and 1,1-dichloroethene.

Now, these chemicals were used back, as

Peter described earlier, in the '30s, '40s, and '50s to clean out the inside of rocket motors that they were testing back in those days, which they don't use here anymore. And that's where the chemicals came from that are now in OU-2.

The OU-2 risk assessment, the human health assessment, determined that there were no risks above regulatory thresholds from exposure to soils or soil vapor.

Now, the primary reason that this risk was so low was the fact that, as Peter described earlier, these chemicals are now more than 50 feet below the ground surface. So exposure to humans is very much unlikely.

However, there is a risk that these chemicals will continue to migrate through the soils and eventually reach the groundwater, and that's the purpose of the remedy that we're talking about here today, is to make sure that those chemicals do not enter the groundwater and pose a further problem in the groundwater.

Now, we are currently studying how to remove these chemicals from groundwater. And that is going to be the subject of a meeting very similar to this probably within a year from now. However, the groundwater and the risk from chemicals in the groundwater, there's no risk because the water purveyors, or those people who deliver

the water to the public, have to meet very, very strict regulatory requirements. So today's meeting is focused on removing this source of contaminants, what we call source reduction, from the soils before they reach the groundwater. And that's the purpose of our meeting here today.

Now, this graphic shows the extent to which any level of a volatile organic compound was detected here at the site during the remedial investigation. Now, the hottest or most -- the highest levels of these chemicals were found in the north central part of the site, right up here where most of the laboratory activities took place. And that's where we focused a lot of our efforts to date doing some pilot studies which I'll talk about in just a moment.

Now, based on the results of the remedial investigation and our ongoing monitoring program of the soil vapor, we have found that the soil vapor and the chemicals in the soil vapor have not migrated off the JPL site boundary; but it does encompass roughly 45 acres on the site.

So based on the analysis in the remedial investigation and also the continuing monitoring we do here at the site, the remedial objective for Operable Unit 2 is to remove the chemicals, the VOCs from the soils before

they migrate to the groundwater.

To meet this objective, kind of as Mark talked about earlier, JPL evaluated several alternatives to remove the chemicals. And of those alternatives, two were selected for very detailed evaluation. And if you look in your proposed plan, I think it's on the third or fourth page, there's a list of nine criteria that we have to go through when evaluating each technology in detail.

The first is called no further action. As Mark talked about earlier, this is a baseline that all other technologies are compared to. Now, at this site, no further action would entail continuing a regular soil vapor monitoring program to see how the contaminants are behaving in the subsurface.

The second, and the proposed alternative, for OU-2 is soil vapor extraction with granular activated carbon treatment and also the continuation of our regular monitoring program. To help evaluate these two alternatives, JPL conducted a pilot test of the soil vapor extraction technology. And this started back in 1998. In over 14 months of operation of this pilot test, we removed roughly 200 pounds of VOCs, of these chemicals, out of roughly up to a maximum of 5,000 pounds that are throughout the site. But within this area, we removed 200 pounds of chemicals from the subsurface.

Now, this was so successful, this system is currently still operating here at the site, and then the pilot study does go on and will continue throughout the proposed plan stage and all the way through the record of decision stage until we decide the final, full-scale size of the technology that we'll put here at the site.

This is a conceptal diagram of how soil vapor extraction works. First you have here, as Peter described earlier, the seepage pits which are no longer existing here at the site. But this is where the chemicals came from, and then the VOCs, chemicals, became deposited here in the soil.

Now, soil vapor extraction is fairly simple. What we do is we apply a very strong vacuum, just like your vacuum cleaner, to suck these VOCs, these chemicals, right out of the soils and the soil vapor into this vapor extraction well right here.

Now, these vapors are -- since we're talking about volatile organic compound, the compound become in a vapor phase when we pull a vacuum on the soils and the soil vapor. So what you're extracting here is air and chemicals in vapor, which comes above the surface through this pump into a vapor treatment system.

The vapor extraction system consists of granular activated carbon. What it does is it captures the

chemicals and holds them within the vapor treatment system, and then clean air is released from the system. What happens every three to six months, depending on how much chemicals we're removing from the system, we have to take those carbon filters that are inside this vapor treatment system and take them to either a recycling facility or dispose of them in some type of legal, regulatory manner. And then we take a new carbon treatment system and replace it and continue the vapor extraction phase. And that's generally how the vapor extraction system works.

So, based on our analysis, alternative one does not meet our remedial objective of keeping the chemicals from migrating to the groundwater; therefore, we're proposing soil vapor extraction as our proposed remedy.

There are several reasons why we're choosing soil vapor extraction from our proposed remedy.

First, it permanently removes the chemicals from the soil and soil vapor.

Secondly, it protects the groundwater from further migration of the VOCs.

Third, it's fairly simple to operate and fairly inexpensive to implement.

Fourth, the treatment period is relatively short, probably from one to five years, depending on how

effective the system is here at the site. But based our on pilot-scale results, it should have been very expected that the cleanup should not take very long.

And, finally, because this soil vapor extraction technology has all those qualities of being very effective in the type of soils here at JPL, in being very effective in removing this type of chemical from the soil, EPA says that this is what is called a presumptive remedy where basically this is the best technology that you can use at hundreds of other sites, including here at JPL, throughout the country. And so we call it what is deemed a presumptive remedy.

So based on our pilot study, and based on our ongoing analysis of the site, NASA proposes soil vapor extraction as the proposed remedy for OU-2.

MR. SAUNDERS: Thank you, Richard.

We are now available for comments and questions from you, the public. As a quick reminder to ensure that all participants providing comments or questions provide equal treatment, please limit your comments or questions to two minutes. We also ask you to please state your first and last name, and spell your last name for the court reporters.

Thank you.

Now, do we have any questions or comments

from the public? Please feel free to come up to the mike, and, again, state your first and last name and spell the last name for the reporters, court reporters.

Thank you, sir.

MR. STORK: My name is Edward Stork, and my last name is spelled S-t-o-r-k. And I actually am the president of the Rose Bowl Riders, which is right next door. And so I was interested to hear that the chemicals are apparently only within the boundaries of JPL; correct? Can you tell me where the soil vapor extraction wells will actually be located?

MR. ZUROMSKI: Sure. I can tell you that at this point in time, the one location that we are currently operating the soil vapor extraction is right where I was pointing at the highest levels of the chemicals that we found in the site.

The other wells -- what we're doing right now is we're doing continuing monitoring of the soil vapor levels at the site, and that actually -- I think Mark described the remedial design phase that occurs after we sign our record of decision where we actually look, at that point in time, where the highest levels of the chemicals are and then we place the wells.

So, no, we don't know exactly where they would be right now; but we would focus on where the highest

levels of the chemicals are.

MR. RIPPERDA: But the level of contamination as you move south -- you're here from the riding stables; right?

MR. STORK: Yeah, just below here, yeah.

MR. RIPPERDA: As he said, the highest level of contaminants -- and can you put that back up. But the highest level of contaminants are up in the northern part, and in itself, it's negligible.

MR. ZUROMSKI: Right. About there where my light is shining is where the current vapor extraction pilot study is operating, and that's where the highest levels of the chemicals were found.

MR. STORK: Just out of curiosity, how much area does one of these vapor extraction wells take up when you install it?

MR. ZUROMSKI: The actual well itself is usually probably from four to six inches just for the well itself; however, the radius of influence from the vacuum at the site can be anywhere from four to eight, seven or eight hundred feet from the center of the well.

MR. STORK: Thank you.

MR. ROBLES: The size of the site, you also want to know how big is that. It's about 45 acres. That yellow spot. None of the wells that we're talking about for soil

vapor will be off-site. It's all on-site because that's where all the soils are at.

But understand also, everybody, that we revisit this periodically. Every five years we go back and revisit so we make sure we're doing the right thing with the regulators.

Any other questions?

MR. RIPPERDA: Also something about --

MR. ROBLES: Because of the comments on Saturday, I want to thank the young lady, we are planning to have a third meeting. And we want to have it in Altadena. And what we want to do is probably -- we're trying to set it up ahead -- I haven't talked to anybody over there -- we'll probably host it in the middle of June so that we can make sure that the whole community has a chance.

I didn't know this, and this is one of the reasons why we have public meetings, is that the folks in Altadena can't make it over here at night because there's no bus service. So we want to know if there are any concerns out there.

So if you get another proposed plan in the mail, please don't get angry at us. We're just announcing that we're going to have a third meeting in Altadena so we can make sure we have the public comments in there. We want to solicit comments. We want to make sure that the

public is comfortable with this. They might have better suggestions, so that's what we're going to shoot for. So I want to thank the lady on Saturday, that was a good comment that we had.

And we have talked to some water purveyors, and they're willing to put it in their billing. So we're going to work on that.

MR. SAUNDERS: All right. Quick feedback from Saturday's meeting.

What other questions do we have, comments? Please feel free to come up to the mike and express your feelings your opinions, your comments, your questions at this time.

MR. CLAIRDAY: Good evening. John Clairday, with the -- and the last name spelled C-l-a-i-r-d-a-y. I'm a board member with the Lincoln Avenue Water Company, which is a neighbor, right next door. We appreciate the opportunity to come over here for this meeting.

Just one statement, and then one question, as well. And I don't think this is inconsistent with what Mr. Robles said, but we already do have a groundwater problem, and I think that's been recognized. But just wanted to emphasize that since it's an area that we're interested in.

And then a second one, I'm wondering about

the effectiveness of this extraction program. Is it a hundred percent effective? How do you know how well you're doing, and does the testing continue throughout that term? And, also, if it's not a hundred percent effective, does that mean that a certain percentage will ultimately reach groundwater and continue to contaminate it?

MR. ZUROMSKI: I'll answer your question.

First of all, every technology that we attempt, we choose because it is the most effective. Hundred percent effective, I don't think we could guarantee. But it is the most effective technology for the types of chemicals at the site and for the types of soils that we have at the site.

Now, what we do to ensure that that is the most effective technology for the site is, number one, we conduct a regular monitoring program of the soil vapor around the site to see -- and to actually watch, we've actually seen some of the data is in the back of the room, you can watch the chemicals that have been removed slowly disappear from the soil. And we do that on a very regular basis. And during our pilot study, we actually did it monthly to see what the effect of the system is on the chemicals in the soil.

Now, what we do for the long term is once we've signed our record of decision, and once we've

installed the system throughout the site, we do -- again, we have a regular monitoring program to see how effective it is. And then at least every five years, we do what is called a five-year review where the regulatory agencies, NASA, sits down, looks at the results, how well the technology is looking. Looks at new possible innovative technologies, if the technology we've chosen was not as effective as we thought it would be, and basically says, "Are we still doing the best thing that we can do to remove the chemicals from the environment?"

And that's generally how we monitor how effective the technology is over the long term.

Now, if you look in the back of the room, we have an estimate, I think. I can't read from here, but it looks like it's a little over $3 million. That's a present value cost of what it will take to operate the system from our estimate one to five years and then monitor for another 25 years after that. So we do continuously monitor this throughout the entire period to make sure that what we've done is the best thing for the site.

As far as a level that we remove the chemicals to, that level is determined during the record of decision where we, as Mark said, we all sit down and agree to a level that we will clean the site to. And that's based on all the regulatory requirements that we're

required to meet.
MR. RIPPERDA: And on an ongoing -- you know, the groundwater that they're also responsible for so over time whatever the recommended decision for the groundwater remedy has, that will include monitoring and clean up of the aquifer. So they're removing the source to protect it from going into the aquifer in the future, but for the contaminants that have already gotten into the groundwater, NASA will, of course, still be responsible for that in the future.
MR. SAUNDERS: Thank you.
Any other questions, comments? Please feel free to take this opportunity.
Thank you.
MS. COMPTON: My name is Cynthia Compton, C-o-m-p-t-o-n. I'll try to be easier on you. I gave a lot of comments on Saturday, and I appreciate your response to my comments.
My first comment is that two minutes is not enough time for my questions and my comments.
MR. RIPPERDA: Can we give her a little extension?
MR. SAUNDERS: Well, again, we can get her more time after the other folks have responded, she can come back up again.
MS. COMPTON: There you go. Quickly, I know that

there was some testing done in building 107 in the basement for the air atmosphere, and I wonder if that has turned into one of the 37 permanent test points.
Another question I have is: I'm interested in a record of the public notices that were sent out in the newspapers and the mailings. And I'm still having a little trouble distinguishing the difference between contamination in particles of soil versus contamination in the vapors, and if maybe we could clarify that a little bit with me.
And the other thing is my same comments I made Saturday, I think we, the public, deserve a little bit earlier notice, and thank you for offering another meeting. I'm going to put that in my official comments, but a little earlier notice and something to the JPL employees that says public meeting may be in the subject title.
MR. RIPPERDA: I'm going to say one thing to the last thing that Cindy said. She showed me a copy of the E-mail that went out, and I don't know how many JPL employees are here, but the actual E-mail didn't say anything about the meeting. It just said, "The proposed plan is available at a website," and she had a great comment that the actual E-mail needs to announce when and where the meetings are. So we'll make sure that NASA, in the E-mail that goes out in the next week or two for the

next meeting, has right in the text of the E-mail that this is a public meeting and when and where it will be.
Oh, and he wants me to talk about soil particles, also.
MS. COMPTON: He's already tried of me.
MR. RIPPERDA: Yeah. So her question pertains to the fact that in the slides it almost always says "soil vapor." It didn't say "VOCs in the soil"; It always said, "Soil vapor." And that's because the actual measurements we take are of the soil vapor.
When the contaminants are 50 feet, a hundred feet below the surface, you actually have to drill a bore hole to get down to it, and the act of drilling that bore hole, the heat and the air that you have to inject to bring the cuttings, the dirt, back up out of the hole, basically blow away all the VOCs that you're trying to sample for. So you can't take a soil very well from a hundred feet deep and analyze that soil for how much contamination it has in it.
So instead what you do is you drill your bore hole, and let it sit for a few weeks, reach equilibrium, and then suck some air out. And because the VOCs are attached to the soil particles and all the soil around your bore hole, they evaporate naturally. And then they'll fill the bore hole when you suck the air out you

see, "Oh, we have VOCs in the air that we're sucking out," so therefore we know that the VOCs in the soil in this location.
So you can do kind of rough correlations between the amount that's in the soil vapor you're measuring to what actually in the soil.
So it's just the physics of not being able to measure the actual particles in the soil; we have to do a correlation between the soil vapor and the soil. So we're always going to talk about soil vapor, even though what we're really concerned about is what is attached to the soil because what gets attached to the soil is what gets dissolved in rainwater, and ultimately brings it on the drinking water aquifer.
MS. COMPTON: But you're talking about cleaning --
MR. RIPPERDA: But when we're sucking, we're sucking the vapor out, but as we suck the vapor out, the particles of the chemicals that are attached to the soil are always evaporating. As we suck more air, more particles evaporate out of the soil, and relatively quickly, you suck those particles of contamination out.
MR. ROBLES: You asked about the building. We're not familiar with that, and I know --
MR. RIPPERDA: You have to talk louder in your answer for the court reporter.

MR. ROBLES: Which building are you in?
THE WITNESS: Building 107.
MR. ROBLES: 107. It must be in our proposed plan. I don't remember it exactly. I can get back to you with that information.
MR. ZUROMSKI: We'll have to respond to that.
MR. ROBLES: Yeah, we'll have to respond to you. Again, I appreciate that. It's not familiar to me after looking at the document. I'll have to research it and get back to you.
MR. SAUNDERS: Thank you.
What other questions, comments, do we have? I'm sure there are plenty of other folks out there that have some feedback for us. Please feel free to come up to the mike and provide your comments, questions.
If there's no other comments or questions, ma'am, if you'd like to come back up and get your next three minutes in, you're welcome to come up at this time.
MS. COMPTON: I'm okay.
MR. SAUNDERS: Well, if there are no other questions or comments, we're going to wrap this up in a moment.
I want to thank you for attending. We encourage you to review and comment on the proposed plan, and there are copies on the back table of the proposed

plan.
Final decisions regarding cleanup will be made after public comments have been received and considered. The public comment period started May 7 and runs through June 11. Keep in mind the comments and questions asked tonight, as well as responses, not only the ones given here but further, more in-depth responsive answers to your comments and questions included in a responsiveness summary which will be included with a RoD into the admin record.
Yes.
MR. ZUROMSKI: The comment period will be extended in accordance with the new meeting.
MR. ROBLES: Okay. We're going to extend the comment period, all right.
MR. ROBLES: We've extended the comment period past the third meeting so, therefore, it's fair for everyone.
MR. SAUNDERS: So instead of waiting for the public to request an extension, we've already extended the comment period at this time.
Do we have a date as of yet?
MR. ROBLES: That will be in the mail.
MR. SAUNDERS: It will be in the information sent out to the public as to how long the comment period has been extended.

And if you could put that slide back up. It's already been mentioned, if there are any further comments, questions, the last slide has Peter's address. Feel free to send your comments, your questions, mail them, E-mail them, to Richard at this address. It's also included in the proposed plan fact sheet.
MR. ROBLES: Peter.
MR. SAUNDERS: And we look forward to any further feedback you may have at this time. And before we close, I will give you one other chance if there are any comments or questions.
If not, thank you for coming and have a good evening.
(Whereupon, at 9:00 P.M., the HEARING was adjourned.)
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STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)
I, Vickie Blair, Certified Shorthand Reporter, number 8940, RPR-CRR, for the State of California, do hereby certify;
That the foregoing transcript is a true record of the proceedings.
I hereby certify that I am not interested in the event of the action.
IN WITNESS WHEREOF, I have subscribed my name this 4th day of June, 2001.

Certified Shorthand Reporter for
the State of California

PUBLIC MEETING AND PUBLIC COMMENT PERIOD

MONDAY, MAY 14, 2001

6:00 P.M.

NASA JET PROPULSION LABORATORY

4800 OAK GROVE DRIVE

PASADENA, CALIFORNIA

PASADENA, CALIFORNIA
MONDAY, MAY 14, 2001; 6:00 P.M.

MR. SAUNDERS: Good evening. We're going to start a couple minutes early. Welcome to the Jet Propulsion Laboratory. Thank you for taking the time tonight for attending this meeting.

My name is Lee Saunders. I am an environmental public affairs officer for the U.S. Navy and the facilitator for tonight's meeting about the proposed plan to select a remedy to clean up soils at the National Aeronautics Space Administration Jet Propulsion Laboratory, located here in Pasadena.

During this portion of the meeting you, the community, can provide questions and comments to these representatives and their agencies on the proposed plan.

Excuse me. Let me backtrack just a moment. Prior to the meeting you had the opportunity to speak with NASA federal and local lead and regulatory agency representatives on a one-to-one basis about the proposed cleanup actions. During this portion of the meeting you, the community, can provide questions and comments to

these representatives and their agencies on the proposed plan. These comments and questions will be included in a meeting transcript and become part of the final decision for soil cleanup at JPL.

Representing the agencies responsible for cleanup and talking to you about the proposed plan and its remedial alternatives are agency representatives, who will each introduce themselves. To my left ...

MR. ROBLES: Peter Robles, of NASA, representing the Superfund cleanup group.

MR. ZUROMSKI: Hi. I'm Richard Zuromski from the Naval Facilities Engineering Command.

MR. GEBERT: I'm Richard Gebert, with the state of California Department of Toxic.

MR. RIPPERDA: And I'm Mark Ripperda, with the United States Environmental Protection Agency.

MR. YOUNG: Hi. David Young, with the Los Angeles Regional Water Quality Control Board.

MR. SAUNDERS: Ground rules for today's meeting are as follows: This evening's format will consist of presentations by our representatives about the proposed plan and remedial

alternatives, followed by a formal comment session where you, the community, can provide us with your comments and questions.

I'm going to ask you to please hold your questions until the presentations have been completed. Once we've heard from all representatives, we will open the floor for questions and comments. You may want to use the comment sheets that are in the back, to write your questions down during the formal comment session, while we're waiting for that opportunity.

To ensure that everyone that wishes to make a comment or ask a question has a fair and equal opportunity do so, we ask that you limit your comments or questions to two minutes. At the end of that time, please take your seat. If you have not finished your remarks, you may continue for another three-minute period after we've heard from all the other speakers.

We have court reporters, two of them, here tonight. So we ask you to please state your first and last name and spell your last name before you begin your comments. If you do not wish to provide verbal comments or questions, you may also submit your comments and questions in writing.

There are comment sheets available on the tables in the back, for those of you in the audience that would prefer to submit your input by this method.

For those of you wondering why the U.S. Navy is involved with the environmental cleanup of a NASA facility, the explanation is fairly simple. In 1999 NASA and the Naval Facilities Engineering Command, more commonly known by the acronym NAVFEC, reached a memorandum of agreement establishing roles and responsibilities that state NASA may procure environmental engineering and consultancy services from NAVFEC and its subordinate commands. In late 1999 NAVFEC became heavily involved in providing environmental services to NASA-JPL.

Peter Robles, remedial project manager from NASA, is our first presenter.

Peter?

MR. ROBLES: Good evening.

What we're going to present today is a site description, give a little history of why this site is on the Superfund list, then we're going to have Mark Ripperda talk about regulatory framework, coming up with Richard Zuromski talking about site assessment and investigation activities and the

remedial activities and the proposed remedial alternatives for OU-2 soils.

We will, at a later date, talk about groundwater. We'll have another public meeting in the near future. But right now what we're focusing on is the soils underneath JPL and how to remediate the contaminants in the soil, to minimize any migration into the groundwater. And that's what we're going to do right now.

The site that we call JPL has been active since the late '30s, early '40s. It was owned by the Army Ordinance, and then it was owned by NASA in '59 to '60, when we took it over.

During the '40s and 50s seepage pits were the main method to dispose of waste. At that time it was the most accepted practice. It was within the regulations, no problem at all. We found out later that that was a mistake and we had to correct that. In the late '50s, early '60s we, NASA, started programming to replace these seepage pits with sewer lines.

Now, in the cas- -- in the question that came in on Saturday was: So contaminants are going down the sewer line. No, they're not. That's a good question. Very little gets put into

landfills. We usually destroy or recycle the chemicals that we use today, or they are used up in the operational processes. We do not do that. Regulatory requirements require us to make sure of that. So from the standpoint today, we are all within regulations. But at the time, the main reason why the contaminants got into the ground soil is because of these seepage pits.

In 1992 the site became a Superfund site. It was put on the national priorities list, and the EPA will talk a little more about that. We are talking about trying to remediate Operable Unit 2, which is the soils.

As I said before, currently all operations meet federal, standard, local requirements. We have a host of regulations that we have to follow and so, therefore, we are assured that we're doing what's right. What we're dealing with is past practices that we have to take care of.

Here is a conceptual model of what we're talking about. What you have here is a VOC plume, volatile organic carbons, that have gone through the soils because of past practices from JPL. The area that we're most concerned with is 50

feet below the surface to about 200 feet, which is the groundwater zone that we're talking about.

In the soils we're talking about chlorinated solvents, and when we say "vadose zone" we mean in the vapors stayed in the soil. NASA wants to address this issue tonight. We will be addressing groundwater in the future.

Now we'll have the EPA talk about regulatory framework.

MR. ZUROMSKI: I just want to ask the court reporters really quick: Can you hear me okay without having to use the microphone?

Okay. We're going to try -- Mark and I are going to try to do ours without the microphone.

MR. RIPPERDA: So I can stand out of the light.

So what's it mean to be a Superfund site and, for that matter, what's -- cool. I get a toy. What's it mean to be a Superfund site. For that matter, what's Superfund.

About 20 years ago Congress passed a law, it's called CERCLA, I won't talk about what the acronym means, that authorized a tax on the chemical industry, and that tax all went into a trust fund

which is called the Superfund, which EPA can spend to clean up abandoned hazardous waste sites. That same law passed by Congress also gave EPA the authority to go to existing, ongoing sites such as NASA-JPL that have contamination that might pose a serious threat to public health.

And we have the authority to force them to clean it up. In order for us to use that authority, we have to rank how bad the potential hazard might be. If it scores high enough, the site's put on a national priorities list, also called the NPL. And, like Peter said, that happened with NASA-JPL in 1992.

So what was it that first got NASA-JPL on the national priorities list? In the late, very late '80s the city of Pasadena found some chemicals in their drinking water wells, right here across the arroyo, just through their standard compliance testing that they have to do with the state of California, and that's what got all of us regulators, the state of California, Richard and David and myself -- well, actually, our predecessors, but that got us involved looking over their shoulders, making sure that they're doing the cleanup appropriately.

Right when the contamination was first found, the city of Pasadena put treatment systems on their wells immediately, which means that anybody who is drinking the water was protected right from the beginning. But to clean up the actual release, to clean up both the aquifer and the source here on site is a long, lengthy process.

And that -- the majority of that process is called the remedial investigation and feasibility study, which means that they have to go out, drill bore holes all over the site, take soil samples, soil vapor samples, that included monitoring wells, take groundwater samples, both on the site -- they also went out into the neighborhoods, put monitoring wells out there, sampled them. They also worked with the water purveyors, to look at their water analyses. And with all of that, they figured out where the contamination is now, where it came from originally, and they go through a process of deciding how best to clean it up.

You usually clean up groundwater contamination by looking at the source, where the contamination is coming from, and at the aquifer itself in two separate stages because you're using

different physical mechanisms to clean up the two. And so what they're working on now and what this whole meeting about is the actual cleaning up of the source here on site, as Peter says, to keep it from going into the water, which means that ultimately the water can be cleaned up faster.

So in the feasibility study, they look at various alternatives on how best to clean something up. And in some cases, such as here at JPL, there is only one real option. I don't know if you've read the proposed plan, but it looks like you were given two choices: Do nothing or do what NASA wants to do.

And that may look like you don't really have a choice, but Congress said that we always have to look at the do nothing alternative because they didn't want EPA out there spending money willy-nilly, making facilities and industry spending money if doing nothing might work. I don't know why they didn't trust us to be good stewards of public money, but they didn't. So in this case, they had to look at the do nothing alternative.

And the other alternative that they've shown to you in the proposed plan, which is called soil vapor extraction, is something that EPA has

found, over the 20 years that we've been doing Superfund cleanups, to be the one system that really works in a case like this, where you've got volatile organic compounds in the soil deep beneath the site. You can't really dig up the site. You know, one alternative might be dig up the whole site, take the soil away. But, obviously, you can't do that here because you'll be digging up all of JPL.

There's some other technologies, such as heating the soil with large electrical currents to actually -- what's called vitrify it, so you turn it into one solid lump, you melt the soil, and you can't do that here. So technology like that, which exists but they don't really make sense for a site, you know, we, the government, don't make NASA do a detailed evaluation of.

So they essentially cut right to the chase and said, "What we're proposing is the one and only system that really works best now. There might be something else that comes along in the future, but for now this is what makes sense."

So once they select a remedy, they have to do a legal document which is called a record of decision. Before you get to that point -- I forgot the most important part. The yellow box,

where we are now, they have to go out to the public and say, "This is what we are proposing. What do you think?" So you can comment both on, you know, their selection of a remedy, but you can also make whatever comments you want on, you know, how they random process, how well they've involved the public, if you think they've been hiding things from you or whatever, which they haven't, but anything you might think, you can make comments on now. It doesn't just have to be on their remedy.

They then have to respond to your comments, they have to check with the regulators, make sure that the state of California and EPA is happy with how they've responded to the public. And at that point, if we're all happy with each other, they do the record of decision, and then they go on for the remedy implementation.

And eventually, if the site gets completely cleaned up, there's no longer a Superfund site, you get delisted from the national priorities list. But even if that happens, there's still always going to be long-term monitoring and review of what the situation is here at JPL.

And, you know, this is just kind of what we've already said. This is a chance for you

to ask us questions, and also make comments on what you think about both the remedy and the process, you know, everything that's going on right now. You can always call Peter. Peter's name and number is in the documentation you got. I don't think my phone number is there but -- it is. Good. You can also feel free to call me. And I'll even say feel free to call the state of California guys, if you feel like you're not getting responses from NASA.

MR. ZUROMSKI: Thank you, Mark.

Hi. My name is Richard Zuromski. I'm with the Naval Facilities Engineering Command and, as Lee described earlier, I'm here to assist NASA in their cleanup efforts here at JPL.

In 19- -- from 1994 through 1998 JPL conducted what's called a remedial investigation, as Mark described earlier. During the remedial investigation, over nine different sampling events, JPL took 45 soil vapor wells, 35 soil borings and three test pits throughout the site to investigate where the chemicals may be found in what we're calling Operable Unit 2. Further, over 37 -- or 37 of those points were turned into permanent monitoring -- soil vapor monitoring points that we now monitor on a regular basis, to see how the

contaminants are moving, or not moving in this case, within the subsurface.

Now, during the remedial investigation, samples identified the extent to which the chemicals were in the soil, and the results showed that there were elevated levels of four different volatile organic compounds. They were carbon tetrachloride, trichloroethene, Freon 113 and 1,1-dichloroethene.

Now, these were -- these chemicals were used back, as Peter described earlier, in the '30s, '40s and '50s to clean out the inside of rocket motors that they were testing back in those days, which they don't use here any more, and that's where the chemicals came from that are now in OU-2. OU-2 risk assessment, the human health risk assessment, determined that there were no risks above regulatory thresholds from exposure to soils or soil vapor.

Now, the primary reason that this risk was so low was the fact that, as Peter described earlier, these chemicals are now more than 50 feet below the ground surface. So exposure to humans is very much unlikely. However, there is a risk that these chemicals will continue to migrate through the

soils and eventually reach the groundwater. And that's the purpose of the remedy that we're talking about here today, is to make sure that those chemicals do not enter the groundwater and pose a further problem in groundwater.

Now, we are currently studying how to remove these chemicals from groundwater. And that's going to be the subject of a meeting very similar to this, probably within a year from now. However, the groundwater and the risks from chemicals in the groundwater, there's no risk because the water purveyors, or those people who deliver the water to the public, have to meet very, very strict regulatory requirements. So today's meeting is focused on removing this source of contaminants, what we call source reduction, from the soils before they reach the groundwater. And that's the purpose of our meeting today.

Now, this graphic shows the extent to which any level of a volatile organic compound was detected here at the site during the remedial investigation. Now, the hottest or most -- the highest levels of these chemicals were found in the north central part of the site, right up here, where most of the laboratory activities took place. And

that's where we focused a lot of our efforts to date doing some pilot studies, which I'll talk about in just a moment.

Now, based on the results of the remedial investigation and our ongoing monitoring program of the soil vapor, we have found that the soil vapor and the chemicals in the soil vapor have not migrated off the JPL site boundary but it does encompass roughly 45 acres on the site.

So based on the analysis, and the remedial investigation, and also the continuing monitoring we do here at the site, the remedial objective for Operable Unit 2 is to remove the chemicals or the VOCs from the soils before they migrate to the groundwater.

To meet this objective, kind of as Mark had talked about earlier, JPL evaluated several alternatives to remove the chemicals. And of those alternatives, two were selected for a very detailed evaluation. If you look in your proposed plan, I think it's on the third or fourth page, there's a list of nine criteria that we have to go through when evaluating each technology in detail.

The first is called no further action. As Mark talked about earlier, this is a

baseline that all other technologies are compared to. Now, at this site no further action would entail continuing our regular soil vapor monitoring program, to see how the contaminants are behaving in the subsurface.

The second, and the proposed alternative for OU-2, is soil vapor extraction with granular activated carbon treatment and, also, the continuation of our regular monitoring program.

To help evaluate these two alternatives, JPL conducted a pilot test of the soil vapor extraction technology, and this started back in 1998. In over 14 months of operation of this pilot test, we removed roughly 200 pounds of VOCs, these chemicals, out of roughly up to a maximum of 5,000 pounds that are throughout the site. But within this area, we removed 200 pounds of chemicals from the subsurface.

Now, this was so successful, this system is currently still operating here at the site and the pilot study does go on and will continue throughout the proposed plan stage, all the way through the record of decision stage, until we decide the final full scale size of the technology that we'll put here at the site.

This is a conceptual diagram of how soil extraction works. First, you have here, as Peter described earlier, the seepage pits, which are no longer existing here at the site. But this is where the chemicals came from, and then the VOCs, chemicals, became deposited here in the soil.

Now, soil vapor extraction's fairly simple. What we do is, we apply a very strong vacuum, just like your vacuum cleaner, to suck these VOCs, these chemicals, right out of the soils and the soil vapor into this vapor extraction well, right here. Now, these vapors are -- since we're talking about volatile organic compounds, the compounds become, in a vapor phase, when we pull a vacuum on the soils and soil vapor. So what you're extracting here is air and chemicals in vapor, which comes above the surface through this pump, into a vapor treatment system. And the vapor treatment system consists of granular activated carbon. What it does, is it captures the chemicals and holds them within the vapor treatment system, and then clean air is released from the system.

What happens every three to six months, depending on how much chemical we're removing from the system, we have to take those

carbon filters that are inside this vapor treatment system and take them to either a recycling facility or dispose of them in some recon- -- some type of legal, regulatory manner. And then we take a new carbon treatment system, and replace it, and continue the vapor extraction phase. That's generally how the soil vapor extraction works.

So based on our analysis, alternative one does not meet our remedial objective of keeping the chemicals from migrating to the groundwater. Therefore, we're proposing soil vapor extraction as our proposed remedy. There are several reasons why we're choosing soil vapor extraction for our proposed remedy.

First, it permanently removes the chemicals from the soil and the soil vapor.

Secondly, it protects the groundwater from further migration of the VOCs.

Third, it's fairly simple to operate and fairly inexpensive to implement.

Fourth, the treatment period is relatively short, probably from one to five years depending on how effective the system is here at the site. But based on our pilot site scale results, it should be very exact and the cleanup should not take

very long.

And, finally, because this soil vapor extraction technology has all those qualities, being very effective in the types of soils here at JPL and being very effective in removing this type of chemical from the soil, EPA says that this is what is called a presumptive remedy. Or basically, this is the best technology that you can use at hundreds of other sites, including here at JPL, throughout the country. And so we call it what is -- what's deemed to be a presumptive remedy.

So based on our pilot study and based on our ongoing analysis of the site, NASA proposes soil vapor extraction as the proposed remedy for OU-2.

MR. SAUNDERS: Thank you, Richard.

We are now available for comments and questions from you, the public.

As a quick reminder, to ensure that all participants providing comments or questions receive equal treatment, please limit your comments or questions to two minutes. We also ask you to please state your first and last name, and spell your last name for the court reporters. Thank you.

Do we have any questions or comments

from the public? Please feel free to come up to the mike and, again, state your first and last name and spell the last name for the reporters -- court reporters.

MR. ROBLES: Somebody ask a question, please.

MR. SAUNDERS: Well, we have some comments from the public.

Thank you, sir.

MR. ZUROMSKI: Thank you.

MR. STORK: My name is Edward Stork, and my last name is spelled S-t-o-r-k, and I actually am the president of the Rose Bowl Riders, which is right next door. And so I was interested to hear that the chemicals are apparently only within the boundaries of JPL, correct?

Can you tell me where the soil vapor extraction wells will actually be located?

MR. ZUROMSKI: We -- I can tell you that at this point in time the one location that we are currently operating the soil vapor extraction is right where I was pointing, at the highest levels of the chemicals that we found on the site.

The other wells -- what we're doing right now is we're doing continuing monitoring of

the soil vapor levels at the site. And that, actually -- I think Mark described the remedial design phase that occurs after we sign our record of decision, where we actually look -- where we actually look, at that point in time, where the highest levels of the chemicals are and then we place the well.

So, no, we don't know exactly where they would be right now, but we would focus on where the highest levels of the chemicals were.

MR. RIPPERDA: But the level of contamination as you move south -- you're here from the riding stables, right?

MR. STORK: Right. Just below here, yeah.

MR. RIPPERDA: As he said, the highest level of contaminants -- can you put --

MR. ZUROMSKI: Sure.

MR. RIPPERDA: You might want to put the example up.

The highest level of contaminants are up in the northern part.

MR. STORK: Right.

MR. RIPPERDA: And as you move south, it's negligible to undetectable.

MR. ZUROMSKI: Right.

MR. STORK: Okay.

MR. ZUROMSKI: Right up here's where -- right about there, where my light's shining?

MR. STORK: Uh-huh.

MR. ZUROMSKI: Is where the current vapor extraction pilot study's operating. And that's where the highest levels of the chemicals were found on the site.

MR. STORK: And just out of curiosity, how much area does one of these vapor extraction wells take up, when you install it?

MR. ZUROMSKI: The actual well itself is usually probably from four to six inches, just for the well itself. However, the radius of influence from the vacuum at the site can be anywhere from four to eight -- seven or eight hundred feet from the center of the well.

MR. STORK: Thank you.

(Inaudible.)

MR. ROBLES: The site -- the size of the site, they also want to know how big is that. It's about 45?

MR. ZUROMSKI: 45 acres.

MR. ROBLES: 45 acres. That yellow spot.

MS. COMPTON: You said none of the wells --

MR. ROBLES: Yes. None of the wells that we're talking about the soil vapor will be off-site, it's all on-site because that's where all the soils are at.

But understand also, everybody, that we revisit this periodically. Every five years we go back and revisit, so that we make sure that we're doing the right thing with the regulators.

Any other questions?

(Inaudible.)

Oh, because of the comments on Saturday -- I thank the lady -- we are planning to have a third meeting. And we want to have it in Altadena. And what we want to do is probably -- we're trying to set it up, I haven't talked to anybody over there. We'll probably host it in the middle of June, so that we can make sure that the whole community has a chance. I didn't know this, and that was one of the things why we have public meetings, is that the folks in Altadena can't make it over here at night because there is no bus

service. So we want to know if there's any concerns out there.

So if you get another proposed plan in the mail, please don't get angry at us. We're just announcing that we're going to have a third meeting in Altadena so that we can make sure that we have the public comments in there. We want to solicit comments. We want to make sure that the public is comfortable with this. We might have better suggestions and that's what we want to shoot for.

So we want to thank the lady on Saturday, that was a good comment that we had. And we have talked to some of the purveyors, and they're willing to put it in their billings. We're going to work on that, as well.

MR. SAUNDERS: All right. Quick feedback from Saturday's meeting.

What other questions do we have? Comments. Feel free to come on up to the mike and express your opinions, your comments, your questions at this time.

MR. CLAIRDAY: Good evening. John Clairday with the -- and the last name is spelled C-l-a-i-r-d-a-y. I'm a board member with the Lincoln Avenue Water Company, which is a neighbor,

right next door. We appreciate the opportunity to come over here and -- for this meeting.

Just a coup- -- one statement and then one question, as well. One -- and I don't think this is inconsistent with what Mr. Robles said, but we already do have a groundwater problem, and I think that's been recognized, but I just wanted to emphasize that, since it's an area that we're interested in.

And then a second one. I'm wondering about the effectiveness of this extraction program. Is it 100 percent effective? How do you know how well you're doing, and is the testing continue throughout that term?

And then, also, if it's not 100 percent effective, does that mean that a certain percentage will ultimately reach groundwater and contaminate it?

MR. ZUROMSKI: I'll answer your question.

First of all, every technology that we attempt, we choose because of -- because it is the most effective. 100 percent effective, I don't think we could guarantee, but it is the most effective technology for the types of chemicals at

the site and for the types of soils that we have at the site.

Now, what we do to ensure that that is the most effective technology for the site is, No. 1, we conduct a regular monitoring program of the soil vapor around the site, to see and actually watch, we've actually seen -- some of the data is in the back of the room. You can watch the chemicals that have been removed slowly disappear from the soil, and we do that on a very regular basis. And during our pilot study, we actually did it monthly to see what the effect of the system is on the chemicals in the soil.

Now, what we do for the long-term is once we've signed our record of decision and once we install the system throughout the site, we do -- again, we have a regular monitoring program to see how effective it is, and then at least every -- just -- every five years we do what is called a five-year review, where the regulatory agencies, NASA, sits down, looks at the results, how well the technology is looking, looks at new, possible innovative technologies if the technology we've chosen was not as effective as we thought it would be, and basically says, "Are we still doing the best

thing that we can do to remove the chemicals from the environment?" And that's generally how we monitor how effective the technology is over the long-term.

Now, if you look the back of the room, we have an estimate, I think -- I can't quite read it from here -- but it looks like it's about three -- little over $3 million. That's a present value cost of what it's going to take to operate the system, from our estimate, one to five years and then monitor it for 25 years after that. So we do continuously monitor this throughout the entire period, to make sure that what we've done was the best thing for the site.

As far as a level that we remove the chemicals to, that level is determined during the remedial or -- excuse me -- the record of decision, where we -- as Mark said, we all sit down and agree to a level that we will clean the site to. And that's based on all the regulatory requirements that we're required to make.

MR. RIPPERDA: And on an ongoing -- you know, the groundwater, you know, they're also responsible for. So over time, you know, whatever the record of decision for the groundwater remedy

has, that will include monitoring and clean up of the aquifer. So they're removing the source to protect it from going into the aquifer in the future.

But for the contaminants that have already gotten into the groundwater NASA will, of course, still be responsible for that in the future.

MR. SAUNDERS: Thank you.

Any other questions, comments? Please feel free to take this opportunity.

Thank you.

MS. COMPTON: My name is Cynthia Compton, C-o-m-p-t-o-n. I'll try to be easier on you. I gave you lot of comments Saturday and I appreciate your response to my comments.

My first comment is that two minutes is not enough time for my questions and my comments.

MR. ZUROMSKI: Can we give her a little extension?

MR. SAUNDERS: Well, again, she can -- we can give her more time after the other folks have responded --

MS. COMPTON: There you go.

MR. SAUNDERS: -- she can come back

for three minutes.

MS. COMPTON: Okay.

Quickly. I know that there was some testing done in Building 107, in the basement, for the air atmosphere, and I wonder if that has turned into one of the 37 permanent test points.

Another question I have is: I'm interested in a record of the public notices that were sent out, in the newspapers and mailings, and I'm still having a little trouble distinguishing the difference between contamination in the particles of soil versus contamination in the vapors. And if maybe you could clarify that a little bit with me.

And the other thing is, that my -- same comments I made Saturday. I think we, the public, deserve a little bit earlier notice -- and thank you for offering another meeting, I'm going to put that in my official comments. But a little earlier notice and something to the JPL employees that says "Public Meeting," maybe, in the subject title.

MR. RIPPERDA: I'm going to say one thing to the last thing.

She showed me a copy of the e-mail that went out, and -- I don't know how many JPL

employees are here, but the actual e-mail didn't say anything about the meeting, it just said the proposed plan is available at a web site. And she had a great comment that the actual e-mail needs to announce when and where the meetings are. So we'll make sure that NASA -- any e-mail that goes out in the next week or two for the next meeting has right in the text of the e-mail that this is a public meeting, when and where it will meet.

And he wants me to talk about soil particles, also. (Laughter.)

MS. COMPTON: He's already responded.

MR. RIPPERDA: Yeah.

So her question pertains to the fact that in the slides it almost always said "soil vapor," it didn't say "VOCs in the soil," it always said "soil vapor," and that's because the actual measurements we take are of the soil vapor.

When the contaminants are 50 feet, 100 feet below the surface, you actually have to drill a bore hole to get down to it. And the act of drilling that bore hole, the heat and the air that you have to inject, bring the cuttings, the dirt back up out of the hole, basically blow away all the VOCs that you're trying to sample for. So you can't

take a soil sample very well from 100 feet deep and analyze that soil for how much contamination it has in it.

So, instead, what you do is you drill your bore hole and then you let it sit for a few weeks, reach equilibrium, and then you suck some air out. And because the VOCs are attached to the soil particles and all the soil around the bore hole, they evaporate naturally and they'll fill the bore hole. And as you suck the air out, you see "Oh, we've got VOCs in our air that we're sucking out," so, therefore, we know that there's VOCs in the soil of this location. You can do kind of rough correlations between the amount that's in the soil vapor you're measuring to what's actually in the soil.

So it's just -- it's the physics of not being able to measure the actual particles of soil, we have to do a correlation between the soil vapor and the soil. So we're always going to talk about soil vapor, even though what we're really concerned about is what's attached to the soil. Because what's attached to the soil is what gets dissolved in rain water as it infiltrates down. That's what ultimately brings it to the drinking

water aquifer.
MS. COMPTON: But when you're sucking it and cleaning --
MR. RIPPERDA: Right. So when we're sucking, we're sucking the vapor out. But as we suck the vapor out, the particles of the chemicals that are attached to the soil are always evaporating. As we suck more air, more particles evaporate off the soil and, relatively quickly, by keeping on sucking, you have sucked most of the particles of contamination out.
MR. ROBLES: I mean, you asked about the building. I'm not familiar with that. I know that samples have been taken.
MR. RIPPERDA: You have to talk louder in your answer, for court reporter.
MR. ROBLES: Oh. You were saying about which building again?
MS. COMPTON: 107, I think.
MR. ROBLES: 107. It must be in our plan. I don't remember it exactly. I can get back to you with that information.
MR. ZUROMSKI: We'll have to respond to that.
MR. ROBLES: Yeah, we'll have to

respond to that.
MS. COMPTON: I'd appreciate it.
MR. ROBLES: I don't -- it's not familiar to me within the document, so we'll have to get back with you.
MR. SAUNDERS: Thank you.
What other questions, comments do we have? I'm sure there's plenty of other folks out there that have some feedback for us. Please feel free to come up to the mike and provide your comments, questions.
If there's no other comments or questions, ma'am, if you'd like to come back up and get your next three minutes in, you're welcome to come back up at this time.
MS. COMPTON: I'm all set.
MR. SAUNDERS: Okay.
Well, if there's no other questions or comments, we're going to wrap this up in a moment. I want to thank you for attending, encourage you to review and comment on the proposed plan, and there's copies on the back table of the proposed plan.
The final decision regarding cleanup will be made after public comments have been received and considered. The public comment period

started May 7 and runs through June 11.
Keep in mind, the comments and questions asked tonight, as well as responses, not only the ones given here but, furthermore, in-depth responses, answers to your comments and questions will be included in a responsiveness summary which will be included with the ROD into the annual record.
Yes.
MR. ZUROMSKI: The time period has been extended.
MR. SAUNDERS: Okay. You're going to extend the comment period. All right.
MR. ROBLES: We're going to extend the comment period past the meeting coming up so, therefore, it's fair for everybody.
MR. SAUNDERS: Okay. So instead of waiting for the public to request an extension, we've already extended the comment period at this time.
Do we have a date as of yet? Or that will be --
MR. ROBLES: It will be in the --
MR. SAUNDERS: It will be in the information sent out to the public, as to how long

the comment period has been extended.
And if you could put that slide back up?
As has already been mentioned, if there is any further comments, questions, the last slide that has Peter's address, feel free to send your comments, your questions, mail them, e-mail them to Richard at this address. It's also included in the proposed plan fact sheet. And we look forward to any further feedback that you have may have at this time.
And before we close, I will give you one last chance. If there's any other comments or questions.
If not, thank you for coming and have a good evening.

CERTIFICATE

I, LESLIE A. MAC NEIL, RPR, CSR No. 7187, in and for the State of California, do hereby certify:

That the foregoing ___-page proceedings were taken down by me in shorthand at the time and place stated herein, and represent a true and correct transcript of the proceedings.

I further certify that I am not interested in the event of the action.

WITNESS my hand this _____ day of _____, 2001.

_____
Certified shorthand
reporter in and for the
State of California

PUBLIC MEETING AND PUBLIC COMMENT PERIOD

COMMENTS AND QUESTIONS GIVEN TO COURT REPORTER

MONDAY, MAY 14, 2001

8:45 P.M.

NASA JET PROPULSION LABORATORY

4800 OAK GROVE DRIVE

PASADENA, CALIFORNIA

PASADENA, CALIFORNIA
MONDAY, MAY 14, 2001; 8:45 P.M.

BY TERRI FORMICO:

Is there any intent to do an anonymous survey of LaCanada residents and employees at JPL of incidences of tumors, cancers, unusual cancers, deaths due to cancer over the last 20 years? That's my question.

Also, employees of La Canada, as well. People who have worked here at least 10 years or so.

The survey should be offered to all members of the community, all employees of the community of both JPL and La Canada, not a random or public event to gather data.

CERTIFICATE

I, LESLIE A. MAC NEIL, RPR, CSR No. 7187, in and for the State of California, do hereby certify:

That the foregoing ___-page proceedings were taken down by me in shorthand at the time and place stated herein, and represent a true and correct transcript of the proceedings.

I further certify that I am not interested in the event of the action.

WITNESS my hand this _____ day of _____, 2001.

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Certified shorthand
reporter in and for the
State of California

PUBLIC MEETING AND PUBLIC COMMENT PERIOD

ELIOT MIDDLE SCHOOL

ALTADENA, CALIFORNIA

WEDNESDAY, JUNE 20, 2001

6:00 P.M. TO 9:00 P.M.

Reported by:

Vickie Blair

C.S.R. No. 8940, RPR-CRR

ALTADENA, CALIFORNIA; WEDNESDAY, JUNE 20, 2001
6:00 P.M.
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MR. SAUNDERS: Good evening. Can you hear me?

Welcome to Eliot Middle School. Thank you for taking the time to attend our meeting this evening. It's a rather hot evening, as you can tell. I am going be a little informal and go without my sports coat this evening, and I invite all of you to relax. In fact, while I know you all have comfortable seats back there right now, in order to get a little more intimate atmosphere, if you don't mind all moving up a little bit and we'll have a little bit better contact and dialogue. If everybody just moves up a little closer, I really would appreciate that. Plenty of seats to choose from.

My name is Lee Saunders. I'm an Environmental Public Affairs Officer with the U.S. Navy and a facilitator for tonight's meeting about the proposed plan to select a remedy to clean up soils at the National Aeronautic Space Administration, Jet Propulsion Laboratory, located nearby here in Pasadena.

Prior to this meeting, you had the opportunity to speak with NASA, federal, local lead and regulatory agency representatives on a one-to-one basis about the proposed cleanup actions.

During this portion of the meeting, you, the community, can provide questions and comments to these representatives and their agencies on the proposed plan. These comments and questions will be included in a meeting transcript and become part of the final decision made for soil cleanup at JPL. Representing the agencies responsible for the cleanup and talking to you about the proposed plan and its remedial alternatives are agency representatives who will each introduce themselves starting down here.

MR. YOUNG: David Young with the Los Angeles Regional Water Quality Control Board.

MR. RIPPERDA: I'm Mark Ripperda from the U.S. Environmental Protection Agency.

MR. ROBLES: Peter Robles from NASA.

MR. ZUROMSKI: Hi. I'm Richard Zuromski with the Naval Facilities Engineering Command.

MR. SAUNDERS: Can everybody hear all of them? No problems? Okay, good.

Ground rules for tonight's meeting are

as follows: This evening's format will consist of presentations by our representatives about the proposed plan and remedial alternatives, followed by a formal comment session where you, the community, can provide us with the comments and questions.

I'm going to ask you to please hold your questions until the presentation has been completed. Once we've heard from all the presenters, we will open the floor to questions and comments. You may want to use the comment sheets that you picked up in the back while you hear the presentation to write down your questions so they stay fresh in your mind.

To ensure that everyone that wishes to make a comment or ask a question has a fair and equal opportunity to do so, we ask that you limit your comments and questions to five minutes. At the end of that time, please take your seat. If you have not finished your remarks, you may continue for another five-minute period after we've heard from all the other speakers.

We have a court reporter over here to my left, your right, this evening; so we ask you to please state your first and last name and please spell your last name before you begin your comments

for the record.

If you do not wish to provide verbal comments or questions, you may also submit your comments and questions in writing. These comment sheets that I mentioned are available on the tables in the back for those of you in the audience that would prefer to submit them by this alternate method.

For those of you wondering why the U.S. Navy is involved with the environmental cleanup of the NASA facility, the explanation is fairly simple. In 1999, NASA and the Naval Facilities Engineering Command, more commonly known by the acronym NAFAC, reached a memorandum of agreement establishing the roles and responsibilities that state NASA may procure environmental engineering and consulting service from NAFAC and its subordinate commands.

In late 1999, NAFAC became heavily involved in providing environmental services to NASA JPL. Peter Robles, remedial project manager for NASA, is our first presenter.

Peter.

MR. ROBLES: Good afternoon. I'm Peter Robles from NASA, and I wanted to just go over the

site description. Here is a list of the participants with the exception of one person, Richard Gebert with the State of California Department of Toxic Substances Control. Everyone else is here.

We are going to do a summary presentation, and the first thing we want to do is a site description, so we will go to that.

The site called JPL has been active since 1939. And it was basically under the auspices of the Corps of Engineers with the Army, and Cal Tech was the organization; JPL was operating the site.

In the '40s and '50s, the way that most disposal was done on-site was through seepage pits, and this was the accepted practice at the time. When NASA took over in the late '50s, early '60s, NASA replaced the seepage pits with sewage systems, and took out the seepage pits, which we believe are the main causes of the migration of chemicals in soils.

In '92, the site was put on the SuperFund list, and at that time it started with the SuperFund process, which will be explained a little later.

Currently, the site meets all of the federal, state, and local requirements. And I

reiterate that at the time in the past those methods were acceptable. We know better now that that was not the best way to do that. But today, we take care of our waste. It's usually used up in the process, basically destroyed in the process, and very little gets disposed of, so we have regulatory controls on how we handle our chemicals on the facility.

Now, the site itself, tonight what we want to talk about is Operable Unit Number 2, which consists of what we call the vadose zone, which is from surface level down to about 200 feet just above the water table. Where our main concern is are the 50 feet to 200 feet under the ground where we have found chemicals from the past are still there in the soils. This creates a potential source of future migration of chemicals into groundwater, and so tonight we want to focus on how to alleviate the vadose zone or the soil located in that area.

NASA intends to address in the future groundwater, hopefully in another year, on what we want to do with the chemicals that are in the groundwater. But for tonight we want to work on OU-2, and get your comments or a recommendation of what way to deal with this site for cleanup.

And now what we wanted to do is go

through the SuperFund process, and I will turn it over to EPA, mark Ripperda.

MR. RIPPERDA: Thanks, Peter, and thanks everybody for coming out tonight.

Peter mentioned that this is a SuperFund site, and that leads to the question: What is SuperFund and what does it mean to be a SuperFund site? A little quick history. Back in the 1980s, congress passed a law that authorized a tax on the chemical industry. That money all remains in a trust fund which is called SuperFund. It's several billion dollars, and that money can be used by EPA to clean up toxic sites, and Congress also gave the EPA authority to oversee existing either government agencies or private companies that have contamination.

But EPA will only get involved if the site goes through a ranking process and it scored badly enough that it's listed on the national priorities list, which is just the national list for all the sites that are SuperFund sites.

So once the site goes through that process and it becomes a SuperFund site, if it's an existing site like JPL, they have to go out, take soil samples, groundwater samples, evaluate how bad

the problem is, what chemicals are there, how the chemicals got there. We're supposed to interview old employees and neighbors around the site. And from that they get a conceptual model, a picture of where the chemicals are, where they came from, where they're going to. And that's called the remedial investigation and a feasibility study portion. That's what JPL just recently completed. So they know where the chemicals are; in this case we're talking about soils.

And the feasibility study, they study how best to clean it up, and that's called the adjustment period. And now they're in the proposed plan and public comment period where they're going to say, "This is what we think the problem is, this is what we're going to do about it, and what do you think?"

So from there, they go to the Record of Decision, to the actual legal document, after public comments have been received or responded to. Then the regulators, such as the State of California Regional Water Quality Control Board, the State of California Department of Toxic Substances Control, and EPA, these are the three regulatory agencies. If we all buy off on the proposed plan, they do the

Record of Decision, then go on to the remedy implementation.

We won't even talk about the agency standards. That's after the site is cleaned up, and that's years from now. But even if the site does get completely cleaned and delisted from the SuperFund list, there still has to be long-term monitoring and review. So in a case like this, you can't call it perpetuity, but they would be required to monitor the water for almost forever.

So in this process, the public -- we like to see the public involved as much as possible. So in things like this we're going to try to do a better job in the future of getting information out more regularly, making sure that documents are all in the local libraries and depositories so you can actually look for yourself to see what JPL, what NASA is doing. But tonight we would just love if you have any questions or comments, and either do it at the microphone or write something down, write something afterwards, if you want, but let us know what you think.

MR. ZUROMSKI: Hi. My name is Richard Zuromski. I'm with the Naval Facilities Engineering Command, and I'm going to talk to you tonight about

site assessment and investigation activities that were done at JPL.

And before I start, I was just reminded to remind you here tonight that the public comment period for JPL has been extended through July 11th. So I just wanted everybody to know that your comments, if you don't get them in tonight or you don't want to do them in front of everyone tonight, please get your comments in to us by mail or by E-mail by July 11th.

First I want to talk about the remedial investigation. From 1994 through 1998, we conducted a remedial investigation at JPL. During that time, in over nine different sampling events, we took samples at 45 soil vapor locations, 35 soil bores, and three test pits. Now, 37 of those soil vapor monitoring locations are now part of a regular monitoring program that we conduct at the JPL site.

The samples that we took from 1994 through 1998 identified the extent of the chemicals in the soils and the soil vapor under JPL. The results showed that there were elevated levels of four volatile organic compounds beneath and in the soils at JPL. Those four compounds were carbon tetrachloride, trichlorethene, 1,1-cichloroethene,

and Freon 113. Some of these compounds, especially carbon tetrachloride, were used to clean, as Peter mentioned earlier, the inside of rocket motors back in the '30s, '40s, and '50s, a lot of the work that they used to do here at JPL. However, that work does not happen here at JPL anymore.

Part of the risk assessment was a human health risk assessment that showed that there were no risks above regulatory limits associated with exposure to soils or soil vapor at the JPL site. The primary reason for this was that the chemicals that we're talking about are more than 50 feet below the ground surface, so exposure to humans is very much unlikely.

However, as Peter mentioned earlier, there is a risk that these chemicals will continue to migrate through the soils to the groundwater table, and so that's what we're concentrating our efforts on here tonight is removing these chemicals from the soils before they reach the groundwater table. The technical term for that is source removal, as again protecting the groundwater from the chemicals that are in the soil.

Now, we are currently studying how to remove the VOCs that have reached the groundwater

table; but that's going to be the subject, as Peter mentioned earlier, of a future meeting probably, in early 2002. However, there is no risk from VOCs in the groundwater because the regulatory agencies mandate -- your water carriers or those who deliver your drinking water to you have to meet very, very strict regulatory requirements. But, again, tonight's meeting is focused on source reduction, removing the chemicals from the soil.

Now, this graphic shows the extent to which VOCs were detected in soil vapor at the JPL site. Now, the extent of the VOCs in the soil there are the extent to which any detection of VOCs were found at the site from the most minuscule all the way up to the highest levels, which are concentrated in the north central part of the site. But based on the results of the remedial investigation and our ongoing soil vapor monitoring program, we found that the VOC plume has not migrated off the site, but does encompass roughly 45 acres on JPL.

So based on the analysis that we did in the remedial investigation, the remedial objective for Operable Unit 2 vadose zone soils is to prevent the VOCs from migrating to the groundwater or, again, what we're calling source removal.

To meet this objective, we evaluated several alternatives, and this was done, in what Mark Ripperda talked about earlier, a feasibility study.

Of the alternatives, two were selected for further detailed evaluation where we go through nine different criteria and evaluate each of the technologies in that nine criteria, and those were the ones that were in the proposed plan mailed to the public and is also available on the table in the back.

The first of these is called "No Further Action." This is a default alternative that is mandated by Congress, and it's the alternative that all other alternatives are compared against. It would really only consist of continuing our ongoing soil vapor monitoring program at the JPL site, and any incidental natural degradation of the chemicals in the soil.

The second, soil vapor extraction with granular activated carbon treatment, would involve installing up to five soil vapor extraction wells and systems to remove the chemicals from the soil vapor before they reach the groundwater.

So to help us evaluate the alternatives, we conducted a pilot test of the soil

vapor extraction technology. During the pilot test in over 14 months of operation we removed over 200 pounds of chemicals from the soil. And the operation of the extraction system continues to date. And since it has been so successful, and we had a lot of good data and good results from that, we're going to discuss that in a little bit more detail here in the next slide.

This is a conceptual diagram of how soil vapor extraction works. First, as you can see, there are VOCs which are the chemicals that came from the seepage pits that are in the soil and the soil vapor. Now, these VOCs from the past disposal practices are then drawn by a vacuum through the well -- over to the right -- into the well and are basically just like a vacuum; they're sucked out of the soil and the soil vapor into that well and then pulled aboveground by the pump into the vapor treatment system.

The VOCs are then sent through the VOC treatment system, which is comprised of granular activated carbon. The activated carbon basically absorbs -- what we would technically calls adsorbs -- the chemicals in the carbon and then holds them inside the vapor treatment system and clean air is

released from the system. The chemicals that remain in the carbon are then taken off-site and recycled, and the new carbon is brought into the system as needed.

So based on our analysis, alternative one, no further action, wasn't chosen because it did not adequately prevent migration of the VOCs to groundwater; therefore, the proposed alternative method is soil vapor extraction.

Soil vapor extraction would be used to reduce the migration of the VOCs to groundwater. The advantages to using soil vapor extraction are, first, it removes and actually reduces the amount of VOCs in the soil and soil vapor.

Secondly, it works very, very well in the types of soils that we have at JPL, which was shown during our pilot study.

Third, again, it protects the groundwater from further migration of these chemicals.

Fourth, it's very simple to operate and fairly inexpensive, as well.

Fifth, the treatment period is relatively short, probably from one to five years.

Now, since this soil vapor extraction

technology has all these qualities, and is so effective at sites very similar to JPL, it's one of the best and most accepted technologies by the EPA and the state regulatory agencies. Therefore, the EPA gives this technology the term "presumptive remedy," and soil vapor extraction is the presumptive remedy that we're using here for Operable Unit 2.

So based on the soil vapor data and the soil extraction on the site and ongoing monitoring program of the soil vapor at the site, NASA proposes soil vapor extraction as the proposed alternative for Operable Unit 2.

Lee.

MR. SAUNDERS: Thank you. We're now open to comments and questions from you. As a quick reminder to make sure that all participants' questions or comments receive equal treatment, please limit your comments or questions to five minutes. We also ask that you please state your first and last name and spell your last name for the court reporter.

In regards to basic information up here for people to contact afterwards if you do not want to provide any questions or comments for you tonight for you to send the questions or comments to.

Do we have any speakers tonight that would like to ask any questions or provide any comments?

MR. RIPPERDA: The two microphones.

MR. SAUNDERS: And please come up to the microphones so everyone can hear you. We have one up here and one back here. This is a great opportunity for you to provide feedback for us. This is a very important process.

Yes, sir.

MR. CRIPPEN: Hi. I'm Bob Crippen. I'm a JPL employee. I also live a couple blocks from the JPL property in La Canada.

MR. SAUNDERS: Sir, please spell your last name.

MR. CRIPPEN: Certainly. C-r-i-p-p-e-n.

My question relates to the topography at the site. You say that the VOCs are 50 feet deep, but the property across the site is more than 50 feet. How does the depth relate to the property? Do the VOC's come closer to the surface as you go down?

MR. ROBLES: Fifty feet measured from the top of the topography.

MR. CRIPPEN: But you're on a hillside.

MR. ROBLES: I know. And we know that the bedrock is to a thousand feet, but what we're saying is that it's below -- wherever the topography is standing, it is not within the first 50 feet anywhere at JPL. It's usually below that, and gets much more higher as you go closer to that 50 feet. And we measured that and wanted to make sure of that simply because we were concerned about exposure to the public. And that's one of the reasons why we tested that first layer all the way through and we sampled the whole -- I know what you're saying. It's 50 feet from the surface wherever the topography is.

MR. CRIPPEN: Fifty feet or more is what you're saying?

MR. ROBLES: Right, right. In some places, 50 feet. If you're on the private road, topography, 50 feet down at south gate, that's correct. But it's still -- because it falls down. It just doesn't come to the surface anywhere on that.

MR. CRIPPEN: Okay. Another question. Where were the pits and how deep were they? Were the pits more than 50 feet deep?

MR. ROBLES: Some of the pits -- first of all, good question. The location was in the north -- I want to say northeast portion of the old farmland;

that's where most of the seepage pits were. We found the old bricks in the seepage pits in some places. Some of them have been taken out over the years. We went and did some investigation. But those pits went about, I'd say, as far down as 30 feet. They were pits. And the key was the chemicals migrated through the surface of it to the ground, sank down below. But that's where all the seepage pits were, in the northeast portion of the land.

MR. CRIPPEN: Is a seepage pit generally near the --

MR. ROBLES: Yes, yes, generally near the east gate.

MR. CRIPPEN: Another question. Your distribution map looks like the distribution went pretty far to the west of the map.

MR. ROBLES: Oh, mostly south. Mostly south because there were some buildings that still were doing some work. It was not just the seepage pits only. There was other work going on in other buildings closer to where the library was -- where it is now. There was some work done there, as well, and you see less as you go there. And the water table rises and causes this [unintelligible] issue within the soil. And that's where the spring came out

there, so it's not like a point source where you wonder where it came through.

MR. CRIPPEN: Recently the sewer system was put into the eastern part of La Canada, and I'm in that area. I live in that area. It's sort of the easternmost part of La Canada. They were putting in a sewer there. And I was taking to the guys when they put the sewer on my street, and I live up on the hill. They said they were going to have -- I didn't follow up on this, but when they were putting the sewers [unintelligible] area because the water table was only about 10 feet below the surface. That's the part of La Canada that's immediatly adjacent to JPL, and you're saying the water table is 200 feet below the surface.

MR. ROBLES: Right. We tested it.

MR. CRIPPEN: Did you verify it?

MR. ROBLES: That's beyond me.

MR. SAUNDERS: One thing you have to keep in mind tonight, while you can ask questions and write comments, the purpose is really to take those comments and questions and give you a formal response back. So they can give you just some general responses, but we really can't expect him to give you a formal answer tonight. So they will give you those

formal remarks back in the official response.
MR. CRIPPEN: Okay.
MR. RIPPERDA: And, also, there is another hour after this informally.
MR. CRIPPEN: That's fair. These are just questions that came up in your presentation, the numbers, the topography, the depth.
MR. SAUNDERS: And you will definitely get answers back in detail.
MR. CRIPPEN: Thanks.
MR. SAUNDERS: Thank you.
Who else would like to ask some questions tonight or provide some comments to us? Great opportunity, a great time to do this. Please feel free to come up. Thank you.
MS. COMPTON: Hi. I am Cynthia Compton, C-o-m-p-t-o-n. I am also a JPL employee. Most of you know me. I've been at all three meetings. I thank you for increasing your comment and question period to five minutes, although I have lots of questions this time. You've incorporated the answers to my questions in most of your presentation.
Back to the seepage pits. I heard you say that they took out the seepage pits, and I'm not really sure if that is technically correct about all

seepage pits because from what I understand, some of them are under the parking lots, some of them are under buildings, and some of them are literally undiscovered and some of them may even be lost. So I just want to bring that out. Is there a plan to go back and identify as many seepage pits as possible and maybe pulling everything out, pulling them out, like you said?
Another question I have is the -- the plume, also. When you talked about the vadose zone, is that the entire area from the surface to the groundwater? Is that the definition of vadose zone? Okay.
And then I just want to comment again that the feasibility study is not at the Altadena Library. I went there after the first meeting, and it wasn't there. I mentioned this. And I went there again last night. And there are change pages there, but the actual feasibility study is not there. And I really don't want everyone to have to go to Pasadena, having to go out to La Canada, having to go to JPL to chase this down. It needs to be provided now. Some of the answers to some of my questions last meeting were -- it's in the feasibility study, so I need to go over there and find the answers.

Also, you mentioned afterwards when you're delisted from the NPL list, the long-term monitoring and review. I'd like to get some quantification of what does that mean, long-term monitoring? Do they come out and look at it once every five years or once every six months? I'm looking for some quantification there.
And then let's see here.
And also something about the EPA presumptive remedy, I'd like a clearer definition of what does that mean. And I guess that's pretty much most of my questions.
MR. RIPPERDA: I'll answer some of the questions, and then we'll get back to that -- so your last question was about presumptive remedies. It's not really a legal term -- it's more of a working term -- where certain types of contamination are seen at almost all the SuperFund sites around the country; and, you know, over the last 20 years, multiple things have been tried. And when you get down to using the same technology over and over again, we have volatile organic compounds in the soils, one tried and true technology is soil vapor extraction. So another presumptive remedy would be treating, processing plants, and a few other industries have

technologies where we always use the same thing over and over again. And when something has been called a presumptive remedy by EPA, it means that the people who are actually spending money -- they skip over a lot of the studies comparing alternative studies and then just cut to the chase, like they did here.
Your other question about long-term monitoring and the future aftermath after we've cleaned it all up, we're done. We don't just walk away. That's where EPA and the State of California says, "You still have to do long-term monitoring to be absolutely sure you got it all." There's something called the five-year review, so every five years they have to write a comprehensive report to summarize everything. That doesn't mean that they just monitor every five years. So when they actually implement the remedy and the remedy is completed, they then have to negotiate between them and us how much monitoring they're going to do, which groundwater wells are going to be monitored, how often they're going to monitor them. And it usually works out to be something like every six months.
Several water purveyor wells will be monitored, and those are all part of the [unintelligible]. I'm not sure that that's being

negotiated, but it's usually once every six months.
MS. COMPTON: Is that in the public depositories?
MR. RIPPERDA: Yes. All of that information is publicly available.
You asked about the seepage pits, and that's more a question for the NASA guys.
Is there anything else that I can answer? No?
Oh, and the incident with the library, I agree with you. I hate to hear that it's not there because, you know, we're absolutely supposed to make sure that they're out there. And the field checking person -- so if it's not there in the future, we'll get it there.
MR. ROBLES: And I apologize for that. There are people who love to take them home, so we have to constantly be checking, so -- that's not an excuse.
Just to get back to what Mark said about the sampling, one of the things that we had to do is submit to them a sampling plan of how we're going to sample long term. I will tell you, I have yet to see a site delisted, you know. So a site is usually studied, monitored, and usually they start monitoring every quarter, and if they don't find

anything, then expanding it and expanding it to six months. If that's working at the location, those documents are available to the public because that's the key. You say, "Well, I want it still to be every quarter," so those would [unintelligible].
On the seepage pits, the pits that were taken out, you probably were talking about the bricks. What we have found is that some of our what we call civilian structures -- and we compare those and we find red brick. Those are the old seepage pits. The plumbing is gone, everything was taken out, and we find the bricks. There's nothing connected to them. It's just the old site location.
We have done soil borings and soil analysis of all that, so we know generally -- we have pictures -- so we can see generally where the seepage pits were and all of that.
Some of them are under buildings, but wherever we have found them, we have done remediation on them and taken samples to see. And off we go, the chemicals that were in there we don't see. They've gone out [unintelligible]. But periodically we'll come across a seepage pit. So those were kind of in the office to see what the site looks like.
Any other items that we didn't

address? If nothing else, we'll answer you back formally, anyway.
MS. COMPTON: Right.
MR. ROBLES: Okay?
MS. COMPTON: Thank you.
MR. SAUNDERS: We had two people come in recently. Just to let you know, we're in a public comment and question period. This is an opportuinty for you to ask questions and provide comments to us about the proposed plan. And we have some microphones around the room for you to come up to the microphones, state your first and last name, and please spell your last name for the court reporter for the record. And, again, these questions and comments are on the record, and you will get formal responses, written responses back.
Any other questions or comments, please feel free to come up to the mike.
Yes, ma'am.
MS. GONZAL: Good evening. My name is Cynthis Gonzal. I'm a resident of Altadena, California. Two questions.
MR. SAUNDERS: Certainly. Would you please spell your last name.
MS. GONZAL: G-o-n-s-a-l. G- as in good

-o-n-z-a-l.
MR. SAUNDERS: Thank you.
MS. GONZAL: [Unintelligible.]
In terms of long term, will JPL actually be monitoring the site or would it be an outside company or agency doing that?
MR. ROBLES: Could you clarify what you mean by "monitoring."
MS. GONZAL: In terms of the toxicity levels.
MR. SAUNDERS: You're talking about that the agency is not doing it themselves?
MS. GONZAL: Yes.
MR. ROBLES: Yes, there are agencies. In fact, two of them are here. How the SuperFund works is that all the documents that we produce for our contractor has to go over to them for review. So we have U.S. EPA, Department of Toxic Substances, the State of California, and the Los Angeles Regional Water Quality Control Board. And they have contractors, subcontractors, that make a lot of comments on our documents.
We go through draft, draft finals. We discuss issues. "Hey, we need more sampling here. We need more lab analysis. Here we need to drill another well here." They are very active in the

process, and it's not just NASA doing its own thing. We have to coordinate through them. We have quarterly meetings called RPN meetings. We have project management meetings. Those are the meetings where we have working groups that decide on how we're going to do this. They have had them for the last 10 years.

MS. GONZAL: Okay. Second question. In the printed material where you talk about the risks associated with exposures to chemicals, and you indicated that there were no risks by regulatory standards.

MR. ROBLES: Right. In the soils.

MS. GONZAL: In the soils. The risk that usually is associated with that, will you be monitoring that aspect, also, as relates to the human element?

MR. ROBLES: Yes. They're called MCLs, maximum contaminant levels. And every time we take samples, quarterly take samples and telling where those levels are, and it's also to make sure that they're not coming to the surface. And we're always having to revisit this to make sure that the public health is addressed.

MS. GONZAL: What parameters are set for

that?

MR. ROBLES: Those are regulatory parameters set by the State of California and the U.S. EPA.

MS. GONZAL: Okay.

MR. RIPPERDA: Just to clarify that a little bit, most of what we've been talking about [unintelligible] is just in the soils, and that's all on-site at JPL. So in the printed material you have there are no risks from these chemicals. That means there's no risk of exposures to the soils at JPL.

But the other component to the whole site is groundwater underneath the site is migrating off-site. We're not really talking about that tonight, but I may as well say a little bit about it.

So some of these chemicals have gotten into the groundwater, and that's why NASA is proposing the cleanup of the soil with soil vapor extraction because they don't want to put any new chemicals into the groundwater. It's much cheaper to clean up the soil than it is to clean up groundwater. So the more you take out before it hits the groundwater, the quicker you can clean up the groundwater long term.

So the chemicals that are in the groundwater could pose a risk if you actually drank

the groundwater without it being treated. But all of the water purveyors, Lincoln Avenue, La Canada, City of Pasadena, if their water levels have contamination above health-based limits set by the State of California or by U.S. EPA, they install -- I think mostly it's carbon treatment around here. And so they treat the water before it gets sent out to anybody in the public. So even though the chemicals are in the groundwater, it's all being treated and taken care of before it's sent out to the public.

So even though it's in the groundwater, it's all being treated and taken care of before the water gets out to the public. So now that we say there's no risk from these chemicals, it's because the water purveyors are actually treating the water.

MR. SAUNDERS: We really appreciate your comments and questions. Who would like to comment or ask a question next? Ma'am.

MS. HIBNER: My name is Sara Hibner. The last name is H-i-b-n-e-r.

Actually, I'm talking about reaching the groundwater; however, many of us around here understand about groundwater and the rain basin and all of those kinds of complexities as to how our

local water is pumped. I think it would be helpful, and in the future when you are discussing groundwater, if you specify that what you are talking about is the rain basin. If there is such a setup by Lincoln Avenue Water that you mentioned or whatever you mentioned, those people that have to live in the area who are informed will be better able to understand exactly what it is you are saying.

Thank you.

MR. SAUNDERS: Thank you.

Who would like to speak next? Any other comments or questions from the public?

Yes, sir.

MR. O'KENE: My name is John O'Kene, O apostrophe K-e-n-e. I'm a resident of La Canada. I apologize for my lack of sophistication. I was born in West Virginia, and the first thing I ever heard back then is when the canary dies, it's time to get out of the mine.

And what you're not telling us or not explaining, and having read the report at the library, what he's not addressed is: What are the potential problems from a breakdown in the extraction system that permits the escape of any of these vapors into the atmosphere? What is the potential danger?

What is the catastrophe level possible? You have 3,000 school-aged students in the direct prevailing winds from where your cleanup site is.

The best laid plans of mice and men often go awry. Tell me that you're going to have monitoring systems set up around that will let you know that there is more come out than should have. These are the remedial actions. What are the preventative actions? And I think that the parents of the students who send their kids to those schools need to know what the potential dangers are. And that is not put out. That information is not made generally available. I understand that there's no risk while it's in the ground, unless your kid digs down in this dirt. But you're pulling it out of the ground, and you're not telling us what could go wrong, how you're going to prevent that from going wrong, and what remedial action needed to be taken in case it does go wrong. I would simply like to see that, not for myself, but for the general population who live in that area.

Thank you.

MR. SAUNDERS: We appreciate your comments on that. We will respond to that in the responses in the summary in detail.

MR. ZUROMSKI: And let me just say the level of detail as we were talking about earlier today is really for a written response because we don't have all that detail here in front of us today.

But what we can tell you, in general, is that, as we talked about earlier today, the systems are designed such as that when there are types of upsets in the system, such as the vacuum break or a vacuum leak or some other type of leak in the system, the system automatically shuts down. And we also have an operator that is on the site at least daily that is monitoring the system to make sure there are not those types of problems.

But we need to address that. The detail that you're asking for today, that really needs a written comment, and we will look back at the feasibility study and see exactly those types of detail that you're looking for. Thank you, though.

MR. SAUNDERS: Any other comments or questions?

Yes, sir. There's a mike right there.

MR. FIEDLER: My name is Dick Fiedler. My office is in Lincoln Avenue Water's domain. Also I live in [unintelligible]. Just a couple questions.

MR. SAUNDERS: Sir, could you please spell your last name.

MR. FIEDLER: F-i-e-d-l-e-r. Like Fiedler, but no baton. Some people recognize the name.

Is there SuperFund money being expended for this meeting?

MR. RIPPERDA: No. All the cleanup is being paid for by NASA.

MR. FIEDLER: Where is the SuperFund money in this cleanup?

MR. ROBLES: Actually, the answer, Mark, all money is being spent by NASA. Not the SuperFund, the federal SuperFund. It's being paid through NASA. We have to put a line item in Congress and get appropriate funds, and that's what we do. But Congress appropriated funds to come through NASA for cleanup.

MR. FIEDLER: Great. NASA, not JPL or Cal Tech?

MR. ROBLES: Right. NASA is paying 100 percent of the bill right now.

MR. FIEDLER: There were, I think, two proposed systems that were shown on the slides up there. The first one shows to preventing the VOCs from entering the atmosphere as that young man --

(Discussion held off the record.)

MR. FIEDLER: There were two descriptions, alternative A and B up there. I'm just kind of wondering which one are we talking about, the first one that had extraction and removing the VOCs before they go into the atmosphere or another one because I didn't see another one?

MR. ROBLES: The alternative number two. The first alternative was no action. And that includes air circulating. Base soil vapor extraction includes that.

MR. FIEDLER: Does the VOC removal require heat?

MR. ROBLES: No.

MR. FIEDLER: So, therefore, the VOCs that are underground basically live there until the pressure is such that they are volatized?

MR. ROBLES: They are in vapor form. They are particles -- the chemicals are around particles, and you pump air through the soil. They volatize and that comes up the pipe and you put them through a carbon system, like a Britta filter, but larger, and it's captured in there.

MR. FIEDLER: I think the VOCs are in a liquid form until you apply the pressure?

MR. ROBLES: Yes, they are in a liquid form.
MR. FIEDLER: And the Navy is going to be in charge of this operation?
MR. ROBLES: [Unintelligible.]
MR. FIEDLER: And they've been doing it out at Vandenberg?
MR. ROBLES: Yes.
MR. FIEDLER: Who else has been employed to do the work?
MR. ROBLES: Other subcontractors that we've had are Force Wheeler.
MR. FIEDLER: But they're doing some analysis work. Who is doing the actual VOC removal? The Navy?
MR. ROBLES: The Navy.
MR. FIEDLER: Under contract with someone else?
MR. ROBLES: No. Under contract to NASA.
MR. FIEDLER: So it's Navy equipment?
MR. ROBLES: Navy equipment, and they sub it out to other subcontractors. One of them is Geofund here who is actually doing the on-site work.
MR. FIEDLER: The on-site work removal?
MR. ROBLES: Yeah
MR. ZUROMSKI: I'm Richard Zuromski from the

Navy.
How it works is NASA sends money to my office, the Navy office, and my office then contracts out with Navy contractors to do the work. The contractor who is actually doing the field work for the [unintelligible] soil vapor extraction and is also doing -- taking the soil vapor samples is Geofund Incorporated, and we have a couple of representatives from them here today. And if you talk to them, they're out there in the field at least four, five, six days a week operating the system, taking samples, and running the system under contract with the Navy. But we get our money from NASA. And it's all under a big -- what Mr. Saunders said earlier, a memorandum agreement between NASA and the Navy.
MR. FIEDLER: I appreciate that, and I'm glad everybody is getting paid.
Are they going to do the rest of the cleanup, or does that go out to bid to the lowest bidder?
MR. ZUROMSKI: No. What's happening is we have two separate contractors. Geofund is one contractor that is actually doing the fieldwork under an existing Navy contract. So they're doing the

actual fieldwork.
We have another contractor, Patel, Patel Engineering Institute, who is the contractor who set up this meeting here today; and they also do the [unintelligible] plan and the mailings that were sent out. But they're also doing the detailed technical analysis of the way the soil extraction wells that are going to be put on the site are going to go. So we have two contractors out working to do this work. First there's Patel. When they try to decide where those wells are going to go, and then once we've decided where they're going to go, we'll give the rest of the work back to Geofund to install the wells and install the systems. And that's the great scheme of how it all works.
MR. FIEDLER: So Patel, under your auspices, is the consulting engineers?
MR. ZUROMSKI: Yes.
MR. FIEDLER: And Geofund is at the site, is actually going to do the work?
MR. ZUROMSKI: Yes.
MR. FIEDLER: Congratulations.
Now, what is the assumption that this soil remediation removing what's in the soil will have no effect on what has gone into the groundwater

as of now? Increased VOCs into the groundwater could result from this vaporization process? Decreased VOCs, I know that would be the hope, but what do you think really reality means?
MR. ZUROMSKI: The reality is, as Mark Ripperda said earlier today and I said, the reality is that this technology actually removes the chemicals from the soil and pulls them above ground for treatment so that they never reach the groundwater.
And as you can see from the results of our preliminary results, from just our pilot test of the soil vapor extraction at the JPL site, we did actually physically remove 200 pounds of these chemicals from the soils before they ever reached the groundwater. So it will actually remove the chemicals from the soil.
MR. FIEDLER: I understand the theory. I think I can almost guarantee you that we've probably, at Lincoln Avenue, removed over 200 pounds of the VOCs that you're talking about that you extracted by vapor extraction. And I imagine the City of Pasadena has removed more than that in their groundwater treatment.
My question is: If you really don't

know what's going to go down versus what's coming up, even though you know what's coming up, it might be more that goes down, I think NASA should do increased testing at the Pasadena water sites and at Lincoln Avenue sites to find out if this is going to be a factor. Because if we have to start using more activated carbon to remove those VOCs, as far as I'm concerned, it's -- there's going to be hell raised on who's paying for it. You understand? So I just don't think you really know. I don't know. I've tried to study the process at length. I don't think anybody necessarily knows what is going to happen to all those VOCs, but you already know they've gone down there and they've contaminated the groundwater. So now -- I mean, we may think that this soil remediation is a Godsend, you know; it's going to solve all the problems. Don't bet too many martinis on it.

MR. SAUNDERS: And Richard --

MR. ZUROMSKI: We're going to have to --

MR. FIEDLER: I really would like to have a transcript of this meeting -- not in the library, but sent to Lincoln Avenue so we can understand and have it in our books.

Is that permissible?

MR. ZUROMSKI: We can take that request under advisement.

MR. FIEDLER: That's all I have to do.

MR. ZUROMSKI: Thank you.

MR. FIEDLER: I thank you very much.

MR. ZUROMSKI: Thank you.

MR. SAUNDERS: Any other questions or comments.

Yes, ma'am.

MS. SCHRANHAZON: My name is Randi Schrahazon, S-c-h-r-a-h-a-z-o-n. Down where I'm [unintelligible] I have two children at the La Canada High School. And are any of the four chemicals that you mentioned, is it possible in the event, say, of an earthquake when monitoring the leaks would no longer be a leak, it would be a crack, would these four chemicals come together and produce something like when a train has a crash and they have the cloud of smoke and they have to evacuate an area?

I mean, not to be personal. I just got out of jury duty today -- because I taught chemistry, but I would not even begin to use that excuse to solve this problem. But could those chemicals, once turned into a gas, combine and create

a cloud which could mean evacuating not only the high school children, but the children above? And then there's a riding stable, and it's pretty difficult to evacuate a hundred and some horses. Then we have quite a bit of evacuation going on a very narrow and crowded street, on La Canada Boulevard.

Is there some kind of a chemical problem here?

MR. SAUNDERS: Well, ma'am, again, we have your comment and it's something that we should respond to in a written response in more detail, and that's what we want, to wait for the responsive summary. I think that would be more appropriate.

MR. ZUROMSKI: I think that leads right into the level of detail as far as chemicals combining and forming toxic clouds are really beyond what we can answer for you right now. But what we can, with the limited response I can give you right now, is that when and if there is an earthquake and when and if there are some power failures, the system operates all in a vacuum. When it shuts off, there's nothing -- you know, the chemicals stay in the ground. There's no more drawn to the surface. So there really couldn't be probably enough risk that they would escape to the atmosphere because none

would be drawn out anymore. But, again, as far as the formation that you're talking about, please submit those in written comment, and we'll give a detailed written response to your comment.

MS. SCHRAHAZON: I'm just curious -- when a carbon filter is removed, you said it's recycled. How? What's that process?

MR. ZUROMSKI: Sure. I'm really not sure of the cost. Actually, what we do is they're in a big carbon canister, and when the carbon canister becomes full of chemicals, we take it off-site to a recycling facility and basically a brand-new canister is put inside. I'm not sure of the actual costs, though, actually, of one those canisters. Again, if you like, I could give you --

MS. SCHRAHAZON: Again, I'm just saying as they're transporting the carbon filters with those very condensed chemicals, they would have to just about drive by the high school. And good luck if it's during pickup and drop-off. And if there was an accident and it did fall off the truck -- I mean, I know these are all what-ifs, but there's a lot of children there, a lot of panic. Maybe with all that in La Canada they should have have some kind of contingency plan here, knowing a truck with chemicals

will be traveling by the school. Maybe do it after school. Maybe do it in the evening.

MR. ZUROMSKI: Again, we will respond to that in writing. But the transportation of hazardous waste and chemicals off-site, we do use a very [unintelligible] to do that. But for details like that, again, submit your questions and we'll respond to that.

MR. SAUNDERS: And just to reiterate a couple of things. What you're providing to us is official comment that's going into the record, and it will be responded to. If you want to write even more details, feel free to submit them, but we have your comments now for the record. And you will get a written response in response to some of them.

And just to clarify one other thing, again, our project managers here have been responding to some of the questions because they are dealing with information that's already out in fact sheets and it's very general information. When we get to hypotheticals and more detailed types of questions and comments, we are required to respond officially in response in a summary, and we can't really give a response here at this particular meeting.

Typically, in this situation, project

managers don't even respond at all to any of the questions. It's very general, but they want to give you some feedback.

Do we have any other questions or comments? Feel free to come on up. We really appreciate.

MR. SHOPTSBERGER: Terry Shoptsberger, S-h-o-p-t-s-b-e-r-g-e-r. I'm a little confused about what the SuperFund really is, if NASA is paying the bill. Also, the second question, [unintelligible] all the way through located in [unintelligible] with the current environmentally unfriendly administration in Washington, how can you begin and how do you guarantee that it's going to continue?

MR. RIPPERDA: So the first part about SuperFund and what is it. My whole description of Congress passing this law that created a tax, all that money is only paid for abandoned sites. So EPA spends that money when the site has been abandoned and nobody else is going to clean it up.

But the sites operating, then Congress gave EPA the authority to make the operating entity, in this case NASA or particularly operating with NASA's money, but we can make them spend their money to clean it up. Peter will talk about the budget.

But just, you know, the environmental climate in Washington [unintelligible], but funding for environmental cleanups has been pretty constant whether it be Democrats or Republicans. That doesn't get messed with that much. And EPA in California still has the authority to take action against NASA. So if Congress were to say, "We're not going to give you money to clean it up," then EPA can take an order against them, which maybe doesn't mean anything, but we have the authority to make them do it. But if Congress just flat out says no, we can't override Congress. But Peter has the information.

MR. ROBLES: Believe it or not, even though this is a friendly [unintelligible] administration they have been sending us, they are not adverse to environmental. They are supporting funding.

The way the funding works at NASA is like it works at other agencies. The actual funding for SuperFund or environmental issues is expensed. It can't be touched. You have to put in actual line item in the budget for that agency. So with NASA going off doing some rocket testing, doing some research, and at the bottom there is this SuperFund budget that you have to put down.

Once Congress funds that, and they

usually fund it at first, that is spent. We are programmed -- we've budgeted three and a half million a year. This year it will be a lot more because they feel that it's important to start the work here. We have been pretty consistent over the years to get something, and we've been cut a little bit and getting more, but we've never been totally axed out of any funding. So we're pretty sure that we'll be funded for that in that sense.

And just to get back to Mark, the SuperFund process is a way for the government to deal with these issues because it puts the onus on us. We can't put a line item in a budget until we get on the SuperFund list. So in one sense, we like the SuperFund because it allows us to immediately put a line item in the budget once we get in the SuperFund process, and that's what helps us.

Do you want to stand up and ask a question?

MS. GONZAL: Sure. What timeline are we talking about in terms of getting approval for the budget?

MR. ROBLES: Could you state your name for the record again.

MS. GONZAL: My name is Cynthia Gonzal.

MR. ROBLES: The budget -- we usually are talking a five-year cycle plan. Every five years. So this year we're planning for this year and the next five years, next year, next five years. So that's usually how the budgets work.

MS. GONZAL: But specifically in terms of when you begin the work -- to do the cleanup process.

MR. ROBLES: We are planning -- once we get approval [unintelligible] to expand what we're doing right now, the pilot study. So we are doing something. But we want to be able to start the whole work as soon as possible.

MS. GONZAL: But you don't know what date that is?

MR. ROBLES: In the next six months, we want to start the construction of the VOC treatment system.

MS. GONZAL: The second part of that: What is the rate of migration or absorption in the soil to the groundwater without this situation?

MR. ROBLES: I wouldn't even hazard a guess. We need to give a formal response to that. We will give you a formal response to that.

MR. SAUNDERS: Who would like to ask questions next? Please feel free to come up to the

mike.

Sir, before we let you come up, I'd like to get any other people first. You will get another chance once we get other speakers, unless there are no other speakers that would like to speak right now.

Yes, ma'am.

MS. SWAIN: My name is Barbara Swain, S-w-a-i-n. I'm not in this field at all, but I have a nephew at UC Berkley who has been involved in the steam extraction process. And I have sent him some information about this and asked him for his comments. And I sent him information that I took from the summary report. And I just wanted to pass along a couple of things. And, actually, I can pass along his whole response, which is --

MR. SAUNDERS: If you'd like to give it to the court reporter, sure.

MS. SWAIN: Okay.

MR. SAUNDERS: She can enter it into the record.

MS. SWAIN: The one comment was he's actively working on a project about removing perchlorate. And apparently this is a little more difficult than we might have thought, and so he wasn't sure that it

should be put on your chemicals of concern list. It's not on it right now because you didn't think it was a problem, but the work that they're doing there indicates that it goes into the fine particle soil and really doesn't come out that easily.

He was also thinking -- suggested that in the 40 years since we quit dumping into the wells, into these seepage tanks, why hasn't all of that already vaporized? And he's guessing that maybe it's tied up with some other product that really also needs to come out, which won't come out on a vaporization. I may not be reading this right, but I think that was the idea. So that perhaps needed to take a little more attention.

And there's a little more here, some of it, but I don't want to repeat it all without reading, and I won't try to do that now. I just want to say I absolutely feel that we need to remove this material from the earth and set an example for the entire country and for private industry. And do it and get it rolling so that it becomes a doable process for any old gas station and anybody who owns property. So I just want to express my own concern that we make this possible and to do it the best way we possibly can. And if we find more stuff than we

thought -- every project that the steam extraction has taken on, at least each of the reports I've read -- Livermore Lab, the Edison site, the Naval Air Station in Alameda, which the Navy people probably know all about -- it seems like there's more stuff than anybody ever expected no matter who was doing the estimate.

So thank you.

MR. RIPPERDA: I have a quick question: Is that a form you can turn in?

MS. SWAIN: Absolutely. I just printed it off the Internet. It was an E-mail. We were just going back and forth. So I will give it on the court reporter.

MR. SAUNDERS: Do we have anybody else that would like to provide any comments or questions? Feel free. This is your opportunity. We like the feedback from you. We really appreciate this. We have a lot of information. Any other comments or questions?

Well, we have comments and questions from the individual that already commented, so I'll go ahead and start with him if there's nobody else at this point in time.

Okay, sir, why don't you come on up.

MR. CRIPPEN: Bob Crippen again. C-r-i-p-p-e-n.

Earlier some of the discussion sounded like this was going to be the first time that something toxic had been removed from JPL. Clearly, it's a large facility. Toxic, hazardous materials are moved in and out of there on a regular basis, just like they are at a gas station. This is nothing new. It must meet current policies, and whatever materials are going past the high school -- there's lots of materials going past the high school on a regular basis. I just want you to keep that in mind.

Question: Is there an estimate of how much material has been dumped at the site? It's probably very difficult because it goes back to the '30s, '40s, and '50s. It probably wasn't monitored.

MR. ZUROMSKI: Actually, I can't tell you an estimate of what was dumped, but I can tell you an estimate of what we believe to be the actual VOCs in soil, soil vapor, which is estimated from two to five thousand pounds of VOCs. That's an estimate of how much is in the soil and soil vapor. I'm not sure how much was actually put into the seepage pits.

MR. CRIPPEN: Of two to five thousand pounds

in the soil, what percent do you think is recoverable?

MR. SAUNDERS: Again, that's something you can save to the response to his question.

MR. CRIPPEN: I guess you would probably have to try and experiment --

MR. ZUROMSKI: We try. Generally, I can't give you a number of how the number is going to be.

MR. CRIPPEN: I understand.

MR. ZUMROWSKI: A hundred percent. Ninety percent. What I can say is that we have regulatory levels that we have to meet. When we do the soil vapor extraction, we have to extract chemicals to those levels. And when we get below those levels, we can shut the system off. So when we meet those levels, that's when the cleanup is done. And those levels are set in a decision which we agreed with the state and the fellow from the EPA to clean up this site.

MR. CRIPPEN: Okay. I think a little earlier we talked about what if something goes wrong. What if gases escape into the air? It raises the question: You recovered 200 pounds in how many days? What is the rate? I mean, if the thing was wide open for a day, how much would escape? A half a

pound? A pound? A pound and a half?

MR. ZUROMSKI: That was a pilot study done over 14 months.

MR. CRIPPEN: So it would be half a pound a day?

MR. ZUROMSKI: [Unintelligible.]

MR. SAUNDERS: We can respond in more detail in the responses.

MR. CRIPPEN: One last question: Where is the -- what I wrote down here is currently operating extractor? I don't know if it's currently operating. Where was the testing well?

MR. ZUROMSKI: It's right next to the fire station in the parking lot of building -- right next to the security fire station from the parking lot.

MR. CRIPPEN: The new building?

MR. ZUROMSKI: Yes. The brand-new building.

MR. CRIPPEN: Thanks.

MR. SAUNDERS: Thank you.

And you had a question.

MS. COMPTON: Hi. Cynthia Compton, C-o-m-p-t-o-n. I heard a couple times -- I heard a couple comments, "That's a great question. Would you please write it down." And so my question is: Do we have to write up our spoken questions?

MR. SAUNDERS: Ma'am, I stated that. What you said verbally is for the record right now.

MS. COMPTON: Okay.

MR. SAUNDERS: If you want to submit any more detailed questions, you can. But what you have said right now is for the record, and it will be responded to.

MS. COMPTON: And it will be responded to. Okay. Those responses will be [unintelligible].

MR. SAUNDERS: No. They will be put together in a response [unintelligible].

MR. ZUROMSKI: However, if you do want a personal response sent to your home to your comment, just put your address on the comment card, and I think there's a little box you can check that says, "I want the written response," and we will mail you your response. So in addition to the responses in the summary, we will also mail the personal responses to your questions.

MS. COMPTON: So for me to receive a response to other people's questions, I have to find -- what is that document called again? -- response to summary?

MR. RIPPERDA: This is a pretty small group, and, hopefully, everyone signed in. Can you send the

responses to everybody that attended the meeting?
MR. COMPTON: That would be great if we could all read all the responses. I know there were some great questions I would like to see the responses to, as well.
MR. ZUROMSKI: Again, as Mark said, we can send it. If everybody does want a copy of the response in the summary that's here at the meeting -- when you signed in make sure you signed it before you leave today, and I guess as long as you're signing in we'll just make sure that the folks who have signed in and have attended these meetings will receive a copy.
MR. SAUNDERS: I just want to clarify something again. What Richard said, this comment sheet, if you fill it out and state at the bottom that you would like to get a written response back, that's perhaps the best way to do it. Otherwise, we will be sending these responsive summaries to people who don't want copies of it, and also wasting the taxpayers money in the process, so we don't want to send unsolicited material.
If they want solicited material, you can fill out the comment sheet here and state specifically when you turn it in that you would like

a written response.
(Discussion held off the record.)
MS. COMPTON: The soil vapor extraction operation, I heard you say that there will be an operator there daily. Does that mean he will be there continuously during the time of operation? So the concern about the gases leaking or anything like that, it won't necessarily be caught by a realtime person that's there at the site at the time it's operating?
And I was going to ask the same questions on the current presidential administration: Is the line item he's talking about or the NASA budget that's for the SuperFund cleanup efforts, is that limited to a certain percent and does that impact the overall NASA budget?
MR. ROBLES: It's called ECR, environmental compliance regulation. It's approximately 45 to 50 million a year, [unintelligible] -- excuse me. So it's a small amount, but it is a consistent amount, and it's always taken out as part of that.
Congress won't let us [unintelligible]; so it's not impacted from the standpoint of, you know, it's always there. It's always required. It's always been filled in one form

or another. Sometimes you get more, but it's never been you're not going to get. Because understand that SuperFund is a continual process. You can't just stop it in the middle. Plus the regulators will get real mad at us.
MR. SAUNDERS: I think there was a comment that each budget is planned five years in advance. You don't just plan for that for the next year. The process is already started, the money funds for five years.
Any other questions or comments?
MR. FIEDLER: It just came to my mind. Dick Fiedler again. Since the Navy has been involved in this for some time now, I was just wondering from a material standpoint, material balance standpoint, these wonderful chemical engineers the Navy has, if you estimated, as you already said, 2,000 to 5,000 pounds of VOCs, question mark, question mark, have you calculated, just for the heck of it, for the last years that JPL has funded the Pasadena [unintelligible] and well water and the stuff that Lincoln has been doing just on activated carbon liquid absorption, have you calculated just how many pounds of VOCs Pasadena and Lincoln has removed from the groundwater compared to what you were saying now

remains in the groundwater? Hasn't that calculation been made?
MR. ZUROMSKI: No. But that will be part of our summary. But no. That would be some of the work.
Again, put your comment in writing. That is something that -- I'm not sure -- let me just say overall how the SuperFund process works is even if -- when we respond to your comments, we're not only responding to you; we're also responding to EPA and the state regulators. And what happens is when we do our Record of Decision, which is the final binding agreement for cleanup at JPL, what is taken into account are the facts that we already decided on as far as the type of technology to use but also other factors. One, community input, which is what you're doing tonight, and also regulatory acceptance, which considers how they feel about the technology plus how they addressed questions like you're raising tonight. So those type of questions and input are things that the regulators may now ask us to go back and do before they'll sign a Record of Decision.
MR. FIEDLER: With all the questions that have been asked tonight, I presume that on the record --

MR. SAUNDERS: Your questions are on the record.
MR. FIEDLER: -- there are going to be some answers?
MR. ZUROMSKI: Yes.
MR. SAUNDERS: Yes. You don't have to submit them in writing unless you want to submit something in more detail. We have them for the record.
Do we have any other questions or comments from the public?
Yes, ma'am. Please step up to the mike.
MS. UNDERWOOD: My name is Nancy Lee Underwood, and I am Underwood Loss Control Environmental
MR. SAUNDERS: Would you spell your last name.
MS. UNDERWOOD: Underwood. Underwood.
I just wanted to make a comment to one of the young ladies, and I know when you're -- I'm a [unintelligible] driver contractor, and I've been around for 19 years, but I wanted to ask a question pertaining to how CPR transporting -- he mentioned something about transporting hazardous waste near the school. There are -- I'd like to answer that

question.
It's not done [unintelligible]; it's done under a controlled environment. The Department of Transportation has hazardous regulations that any hazardous waste contract must apply to before transporting on any local streets. So all the plans are made in advance, you know. The director has to write a whole plan and all the regulatory requirements have to be in line with that so it's safely done.
Another area I just want to [unintelligible], and then I'll be done. Anytime there's an environmental contract that [unintelligible], you have your geologists, hydrogeologists, who I report to at our [unintelligible] on a regular basis. I operate all the time monitoring the environmental -- environment -- getting [unintelligible]. This is so they know exactly, if it goes anywhere near, there are engineering controls if you have any exposure to the environment.
MR. SAUNDERS: Thank you.
Any other comments or questions, feedback from the public? Again, this is a great opportunity.

MS. GONZAL: Last question.
MR. SAUNDERS: Again, please state your name for the record.
MS. GONZAL: Sorry. Gonzal, G-o-n-z-a-l, last name.
This doesn't in any way affect the community by virtue of the number of people that are here. My concern is: How public will this hearing be made to the community?
MR. ZUROMSKI: Are we talking about how we advised of this meeting?
MS. GONZAL: How we responded to the concerns of the community that are present in the meeting?
MR. ZUROMSKI: That is what we call a response summary, what we've been referring to tonight. What happens is we collect all the comments that were received either in writing or given orally here tonight. And what we do is we take each of those comments by themselves and in response to your written responses, and we put together a document that's called a responsiveness summary. And as we mentioned earlier tonight, we're going to mail it to everybody that has been present at this meeting. We're going to mail you a copy of this responsive summary. However, that responsive summary is also

put into what we call our information depositories which are about three or four libraries that are mentioned in the pamphlet that's up at the front desk of the proposed plan. We put a copy of that in there for anybody else who maybe did not come to the meeting. They can come and look at it there.
MS. GONZAL: How about the local newspapers like "The Star News"?
MR. SAUNDERS: You have a reporter right over here.
MS. GONZAL: Okay. Just asking.
MR. SAUNDERS: Any other comments? Questions? Feedback? Please feel free to step up and express yourself at this time. No one else that would like to ask any further questions? No other comments. Yes.
MS. SUTLAFF: This is just a comment just to let you guys know, I am a reporter with the "Pasadena Star News." And I may or may not write a story from today's, but I did write a story for Sunday's paper. And I just wanted to tell people about it just -- you can get it off the web, and I encourage you to buy "The Star News." But it is a concise explanation of what they're planning to do, and it gives a little history. So our website is www.Pasadenastarnews.com.

And they did place advertisements for this, as well. So I wrote that article so that people in the community would know about the meeting.

MR. SAUNDERS: Could you state your name.

MS. SUTLAFF: I broke the rules. It's Visha, V-i-s-h-a, Sutlaff, S-u-t-l-a-f-f, as in Frank.

MR. SAUNDERS: And this is also the third public meeting we've had, and I know that she has attended at least two of the public meetings. And we've had them at roughly two different locations. Two of them were in two different locations in JPL, and this is the third meeting. Which is rather unique. Most public meetings for remedial action for proposed plans do not have three meetings, public meetings. In fact, the guidance from U.S. EPA is basically one public meeting, and we've had three of them. I just wanted to tell you.

MR. ZUROMSKI: And in addition to the article that Visha did in Sunday's paper, she also did an article previously from the first public meeting in the "Pasadena Star News." And also I believe it's Saturday's "Foothill Leader" edition, there's another article, interview with Peter Robles and myself about the actions that we're taking at OU-2. So there are circulating out there some articles that have been

done on the site.

And you can speak with us about those afterwards. We're going to be available right after this comment period is closed. You can speak with us on a one-on-one basis. And also back to our information depositories, all of those newspaper articles and clippings can be found in our information depositories, as well. So you can go back and read those articles at a later date.

MR. SAUNDERS: Any other comments, questions, feedback from the public? This is your great opportunity to give us feedback. We appreciate it, everything that you say. It makes us do our job better. Any other questions?

If not, I want to thank you for attending tonight's meeting. I encourage you to review and comment on the proposed plan. Final decision regarding cleanup will be made after public comments have been received and considered.

Keep in mind, as stated, that the public comment period started May 7th and runs through July 11th, 65 days, which is, again, a rather unusual time. It's longer than normal that's recommended for a public comment period.

So feel free, if you didn't want to

provide any verbal comments or questions tonight, to submit your questions and comments to Peter Robles remedial project manager here at JPL. You have his address up here. It's also listed in the proposed plan fact sheet that is available in the back where we have the poster board displays.

If there's nothing else at this time, thank you for attending. Good night.